

# **SEABOARD LUMBER SITE AQUATIC HABITAT RESTORATION PROJECT**

## **ENVIRONMENTAL ASSESSMENT**

**Elliott Bay/Duwamish Restoration Program  
Seattle, Washington**

Lead Federal Agency: National Oceanic and Atmospheric Administration  
Cooperating Federal Agency: U.S. Fish and Wildlife Service

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10/15/98  
Seaboard NEPA Document

# **SEABOARD LUMBER SITE AQUATIC HABITAT RESTORATION PROJECT**

## **ENVIRONMENTAL ASSESSMENT**

### **Executive Summary**

This Environmental Assessment (EA) was prepared under the requirements of the National Environmental Policy Act (NEPA), as amended (40 CFR Part 1500), to determine the significant impacts to the quality of the human environment from the preferred environmental alternative for the Seaboard Lumber Site Aquatic Habitat Restoration Project. This project is proposed under the Elliott Bay/Duwamish Restoration Program (EBDRP). EBDRP is a cooperative, inter-governmental program established under a consent decree to help restore natural resources injured by pollution in Elliott Bay and the lower Duwamish River. The National Oceanic and Atmospheric Administration (NOAA) and the U.S. Fish and Wildlife Service are federal natural resource trustee members of the EBDRP Panel. The program involves both sediment remediation and habitat improvement projects in Elliott Bay and the lower Duwamish River. The consent decree identified the need to remediate various contaminated sites and restore habitat for the purpose of restoring aquatic health and human safety.

The Seaboard Lumber project will recreate previously lost intertidal habitat and functions necessary for the successful survival of juvenile salmon migrating down the Green/Duwamish River system, which are subjects of a potential "threatened" listing under the Endangered Species Act.

Based on a review of the environmental impacts associated with the six proposed alternatives, Alternative 6 was selected as the preferred alternative. The Alternative 6 proposal includes excavating an intertidal basin, constructing shoreline protection, and introducing aquatic and upland habitat improvements. The intertidal marsh to be created on the site will be approximately 1.8 acres in size (77,300 sq. ft), excavated from elevation -11.2 feet Mean Lower Low Water (MLLW) to approximately +6 ft. MLLW. The intertidal basin is designed with a curvilinear edge to create a more natural appearance, and to maximize habitat diversity in the edge zone. Substrate composition is an important consideration for the success of the intertidal habitat. Approximately 3,000 cu yd of material will be imported, amended with organics, silts and clays, and distributed over the basin at depths ranging from 1 to 4 feet. Sources under consideration range from dredged material to be mixed onsite, to manufactured soil of specified content. A transitional scrub/shrub habitat is proposed between the intertidal marsh, upland meadow and forested habitat to be introduced on the site. Proposed construction will require removing existing concrete pads (former building foundations), pavements, railroad spurs, and an existing dock; extensive regrading; installing plantings to establish an emergent intertidal marsh; and the addition of a small parking lot, crushed rock pathways, and an informational kiosk.

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# SEABOARD AQUATIC HABITAT ENHANCEMENT PROJECT

Report to the Corps of Engineers

01-30-98

Prepared by Lee/Brennan ECG International, Inc.  
Prepared for The City of Seattle Department of Parks and Recreation

## WETLAND NAME:

The project area includes two wetlands, Wetland A and the Duwamish Waterway

## WETLAND CATEGORY:

See Seaboard Wetland Delineation Report attached.

## PRESENT USE:

The project site is presently vacant and unused.

## TARGETED USE:

The project design provides intertidal marsh habitat for fisheries enhancement, viewing, passive recreation and public education purposes. A longer shoreline will be created, which is naturalistic, planted with native trees, shrubs and groundcovers to provide food, cover and reproductive habitat for wildlife. The project will improve the visual quality and natural diversity of the waterway. Handicapped accessible paths and viewpoints will be created, in addition to an informal outdoor classroom space, interpretive signage and a small parking lot.

## CLEARING STATISTICS:

Clearing of less than 400 sq. ft. of wetland vegetation is proposed. Upland clearing entails the removal of small areas of blackberry brambles and several alder saplings.

## GRADING STATISTICS

Total site uplands: 5.7 acres

Total site submerged lands: 1.1 acres

Total Material Cut in Wetlands -

Total Material Cut in Wetland A = 30 CY (<200 SF area)

Total Fill Material in Wetlands -

Total fill in Wetland A = 30 CY (gravel and cobbles)

Total area of fill in Wetland A < 200 SF (0.005 acres)

Total fill in Duwamish Waterway = 270 CY (gravel and soil)

Total area of fill in Duwamish Waterway = 1460 SF (0.03 acres)

Total Shore Protection material to be placed on shoreline from MHHW

(11.2 ft. MLLW) down = 12,520 CY of gravel and cobbles

Total area of Shore Protection material to be placed on shoreline from

MHHW (11.2 ft. MLLW) down = 56,480 SF (1.3 acres)

## Note:

Shore Protection is recommended to provide an optimum substrate for the benthic community and salmonids, protected from the wave environment of the waterway. A naturalistic shore protection design is proposed using cobbles installed at a 4H:1V slope. Shoreline protection is also critical to insure that existing on site soils with residual concentrations of chemicals stay in place and do not enter the Waterway.

## WETLAND ENHANCEMENT/RESTORATION

Total Area of Wetland created from MHHW (11.2 ft. MLLW) down = 77,300 SF

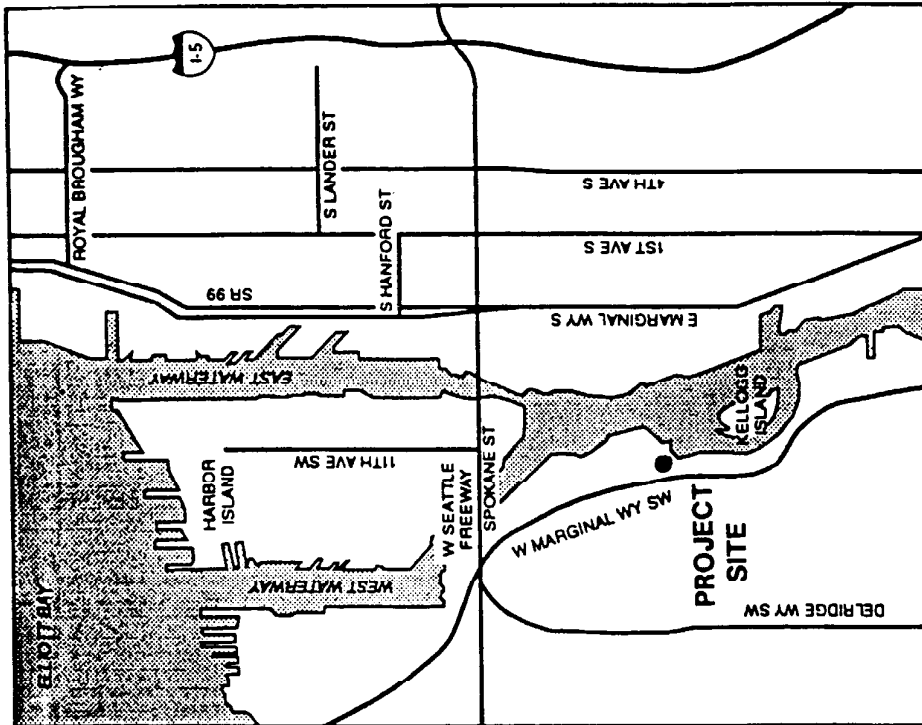
(1.8 acres)

Restored Open Water by Removal of Existing Dock = 9,200 SF (0.21 acres)

## SHORELINE LENGTH

Existing Shoreline Length at MHHW (11.2 ft. MLLW) = 1,350 LF

Proposed Shoreline Length at MHHW (11.2 ft. MLLW) = 3,400 LF



Seaboard Lumber Site Location Map

N.LAT. = 47DEG. 33MIN. 42SEC  
W.LONG. = 122DEG. 20 MIN. 59SEC



NOT TO SCALE

PROPOSED:  
INTERTIDAL MARSH CREATION  
WITH VIEWPOINTS  
IN: CITY OF SEATTLE  
AT: SEABOARD LUMBER SITE  
COUNTY OF KING STATE: WA  
APPL. BY: SEATTLE PARKS +  
RECREATION  
DATE: JANUARY 30, 1998  
FIGURE 1 OF 12

CITY OF SEATTLE  
DEPARTMENT OF PARKS  
AND RECREATION

3111 SECOND AVE. 4TH FLOOR (800-7031)

FACILITY TITLE  
SEABOARD LUMBER  
AQUATIC HABITAT RESTORATION

FIGURE 1. LOCATION MAP

PURPOSE:  
FISHERIES HABITAT ENHANCEMENT,  
PUBLIC VIEWING + EDUCATION  
DATUM: MLLW=0.0 (N.O.S.)  
ADJ. WATERFRONT PROPERTY OWNERS:  
HOLLAND AMERICA, PORT OF SEATTLE,  
+ CROWLEY MARITIME

PREPARED BY:  
Lee/Brennan Associates  
E C G International Inc.

# **Seaboard Lumber Site Aquatic Habitat Restoration Project Environmental Assessment**

## **1.0 Introduction: Need for Restoration**

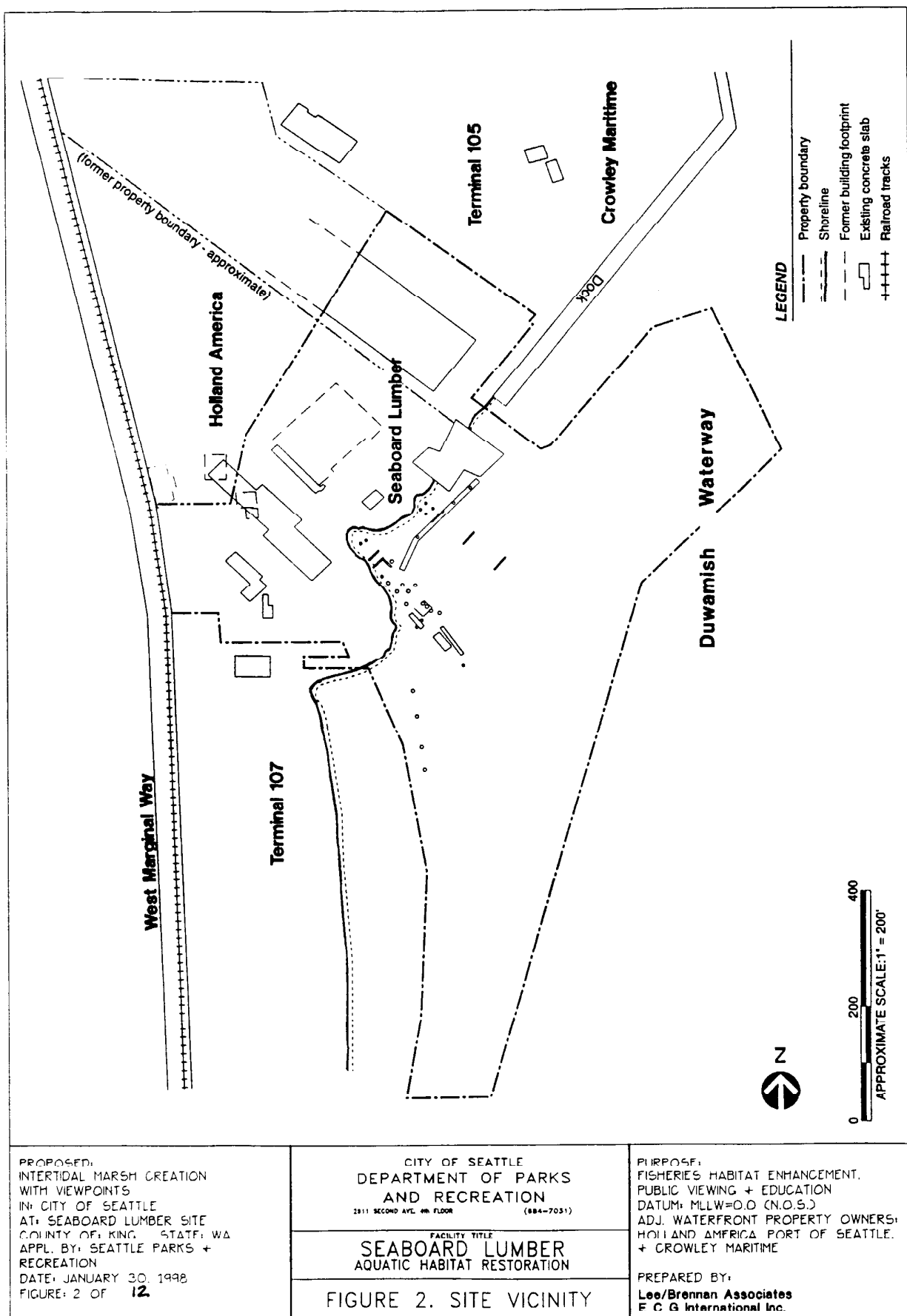
This Environmental Assessment (EA) was prepared under the requirements of the National Environmental Policy Act (NEPA), as amended (40 CFR Part 1500), to determine the significance of the Seaboard Lumber Site Aquatic Habitat Restoration Project's potential environmental consequences. This project is proposed under the Elliott Bay/Duwamish Restoration Program (EBDRP). EBDRP is administered by a panel of participating governments responsible for implementing the requirements of the 1991 settlement reached between the natural resource trustees and King County and the City of Seattle. The program involves sediment remediation, habitat development, and source control projects for the purpose of restoring aquatic health and the human environment in Elliott Bay and the lower Duwamish River.

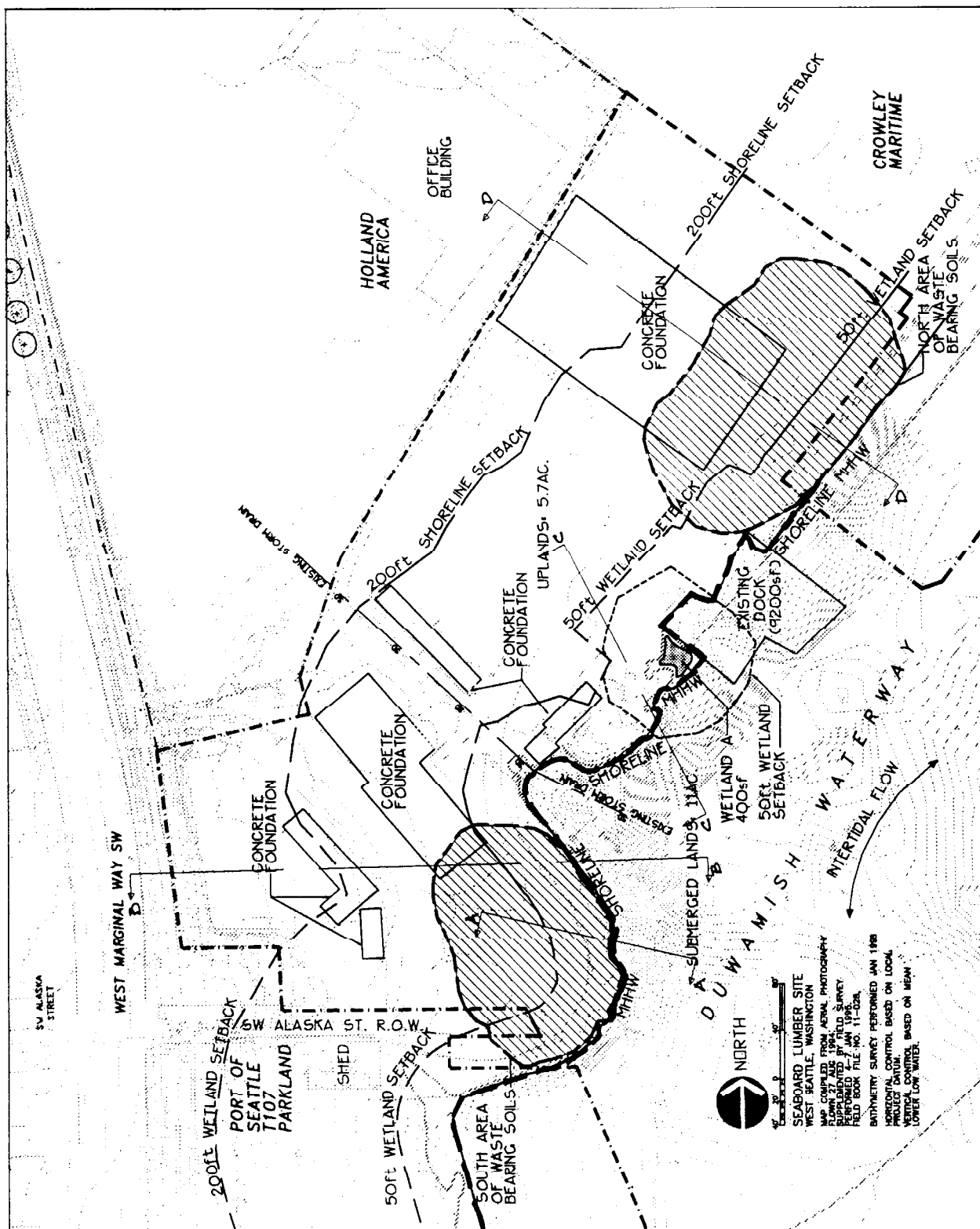
The EBDRP participants are the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), the U.S. Department of the Interior Fish and Wildlife Service (USFWS), the Muckleshoot Indian Tribe, the Suquamish Tribe, the Washington State Department of Ecology (Ecology), the City of Seattle, and King County. NOAA is the federal lead agency for NEPA compliance issues and the USFWS is a cooperating agency for this purpose.

This EA incorporates by reference the Concept Document, Elliott Bay/Duwamish Restoration Program, Panel Publication 7, 1994. The Concept Document describes the program, the criteria used to identify and evaluate projects and sites, the potentially affected environment, alternative techniques and technologies utilized, and the potential impacts during and subsequent to sediment remediation or habitat restoration projects. The Concept Document also describes the environmental review process. The reader is referred to the Concept Document for this programmatic information, which is not repeated in the EA. Other resource documents incorporated by reference in this EA are noted in the References Section (section 9.0). The Concept Document and other EBDRP Panel publications may be found at the repositories listed in section 10.0.

During the drafting of the Concept Document, the EBDRP Panel members held a number of public informational meetings and provided opportunities for public comments to the draft versions of the document. During February, 1998, the City of Seattle (EBDRP Panel member and project manager for the Seaboard project) held an informational public meeting to present the design concepts for the project. Additional public opportunities to review and comment on the project will be provided, in accordance with NEPA, 40 CFR Part 1503.

The Concept Document identified the Seaboard Lumber mill site as one of a number of potential habitat restoration sites. The goals and objectives of the project are consistent with the restoration mandate set out in the Consent Decree and the Concept Document. The project is intended to restore the Seaboard Lumber site to intertidal habitat with upland buffers, and to protect the Duwamish Waterway from exposure to onsite soils at the shoreline that contain residual





PROPOSED:  
INTERTIDAL MARSH CREATION  
WITH VIEWPOINTS  
IN: CITY OF SEATTLE  
AT: SEABOARD LUMBER SITE  
COUNTY OF KING STATE: WA  
APPL. BY: SEATTLE PARKS +  
RECREATION  
DATE: JANUARY 30, 1998  
FIGURE: 3 OF 12

CITY OF SEATTLE  
DEPARTMENT OF PARKS  
AND RECREATION  
2911 SECOND AVE. 4TH FLOOR (800-7031)

FACILITY TITLE  
**SEABOARD LUMBER**  
AQUATIC HABITAT RESTORATION

FIGURE 3. EXISTING CONDITIONS

PURPOSE:  
FISHERIES HABITAT ENHANCEMENT,  
PUBLIC VIEWING + EDUCATION  
DATUM: MLLW=0.0 (N.O.S.)  
ADJ. WATERFRONT PROPERTY OWNERS:  
HOLLAND AMERICA, PORT OF SEATTLE,  
+ CROWLEY MARITIME

PREPARED BY:  
**Lee/Brennan Associates**  
**E C G International Inc.**



concentrations of chemicals. Secondary objectives of the project include passive park use, and environmental education.

The property is a portion of what was formerly the Seaboard Lumber mill and is now owned by the City of Seattle. The mill operated at this location between approximately 1929 and 1984. At its peak, from 1970 to the early 1980s, the Seaboard Lumber site included 12 acres of upland property and 11 acres of submerged tidelands extending into the Duwamish Waterway. The northern half of the uplands (6 acres) was acquired in 1994 by Evergreen Trails, a subsidiary of Holland-America Lines, for development of a bus maintenance facility. The 6 acres to the south and the 11 acres of submerged land are still referred to as the "Seaboard Lumber Site", even though mill operations ceased more than 15 years ago (see Figure 2). Buildings were removed by an interim owner in the late 1980s.

Due to historical industrial use and development of the site, the property has undergone several soil, sediment, and groundwater sampling investigations to confirm the extent and degree of contamination. Low concentrations of contaminants were observed in most of the offshore sediments and upland soils analyzed. Two upland areas of waste-bearing soils are located near the south and north boundaries of the site at the shoreline (see Figure 3).

The southern area of waste-bearing fill is approximately 35 feet deep, extending below the water table. Groundwater quality testing has confirmed that residual chemical constituents are no longer mobile. Therefore, the proposal includes over-excavating the waste-bearing fill 1 to 3 feet below proposed design grades, covering the area with filter fabric, cobbles, and clean soil suitable for the growth of upland vegetation.

The northern area of residual contamination is shallow (3 to 6 feet deep). This area will also be over-excavated and covered to achieve final design grades in the intertidal basin. Soils with residual concentrations of chemicals will be: 1) removed, transported, disposed or recycled at an approved upland disposal site; 2) redistributed onsite if it meets structural fill requirements; or 3) used as fill to create onsite berms if of non-structural quality. Any of this material redistributed on the site will be covered by 1 to 3 feet of clean, amended soil, suitable to support vegetation and habitat types in the areas where it may be placed. Site restoration will be performed under the Washington Department of Ecology's Voluntary Cleanup Program (VCP), in accordance with the state's Model Toxics Control Act (MTCA).

## **2.0 Project Area**

### **General Site Description**

The Seaboard Lumber Site Aquatic Habitat Restoration Project is located at 4540 West Marginal Way SW, Seattle, Washington, and is adjacent to the Duwamish River. The EBD RP bought the property to restore as a habitat restoration site. The site has been deeded as a habitat site in perpetuity, and will be managed by the City of Seattle Parks and Recreation Department. The site, approximately 16.7 acres of former industrial land and intertidal area, lies east of West Marginal Way SW, between the roadway and the Duwamish River, adjacent to the north side of the SW Alaska Street right of way and encompassing the Duwamish River end of the SW Alaska Street right

of way. The property straddles the SW ¼ of Section 18 and the NW ¼ of Section 19, in Township 24 N, Range 6 E.

The project will develop a 5.7-acre intertidal and upland habitat restoration parcel using the former Seaboard Lumber industrial land and a small segment of existing intertidal area. The site is located in the area of the former Duwamish Estuary, large portions of which were filled for the creation of industrial land beginning in the early 1900s. The site was originally tideland built up with fill material, including sediment dredged from the Duwamish River. Channel straightening (creation of the Duwamish Waterway) and major filling was completed around 1921.

The Seaboard Lumber site is currently vacant. Former structures associated with the mill operation were previously demolished by previous owners. A shoreline dock (approximately 9,200 sq. ft in size, constructed of creosoted piles and planking), concrete foundations, areas of paving and partially buried railroad spurs are all that remains of the former industrial operation. The largest foundation is that of the former Alaska Freight building, approximately 80 x 400 ft in dimension near the northern boundary. The structure supported by this foundation was originally a large warehouse used by the Seattle North Pacific Ship Building Company. After 1929, the warehouse was used by Seaboard Lumber company as a kiln room for drying lumber. Other foundations on the site include that of a former lunch room; planer chain room; a former mill addition; oil house, oil service pit, transformer location; welding shop and switch room associated with the lumber mill operation. These foundations are all concrete slabs ranging from 8 to 12 inches or more thick (see Figure 4).

Property to the north was recently developed as a charter bus home base for approximately 150 buses, and the administrative offices of Holland America. This site (6 acres) was also formerly a portion of the Seaboard Lumber property, now separated from the City of Seattle's parcel by a low concrete wall to contain drainage, and a chain link fence.

Crowley Maritime owns property adjacent to the east boundary of the Holland America site. Crowley operates a storage area for ship and barge deck machinery at this location. Birmingham Steel leases Port of Seattle Terminal 105 property adjacent to Holland America and Crowley Maritime for a scrap metal stockpiling and baling operation.

The Port of Seattle also owns Terminal 107 adjacent to the Seaboard Lumber site south boundary. This property is vacant at the north end, and includes a registered archaeological cultural resources site: Duwamish No. 1 Site (45KI23). The southern portion of the Terminal 107 property (7.8 acres) was cleared in 1996 and improved with trails, view points, and plantings as a public shoreline access site. Other amenities include a gravel parking lot for 24 cars, and portable toilets. Pedestrian trail connections may be created between the Terminal 107 public shoreline access and Seaboard Lumber aquatic habitat restoration sites. The properties are also connected by the Duwamish Trail, a 10-ft wide asphalt trail between the uplands and a railroad track, for use by bicycles and pedestrians.

Kellogg Island, southeast of the Seaboard Lumber site within the Duwamish Waterway, is a Port of Seattle property, permanently preserved as a Conservancy Recreation area and wildlife habitat. Public access to the island is discouraged.

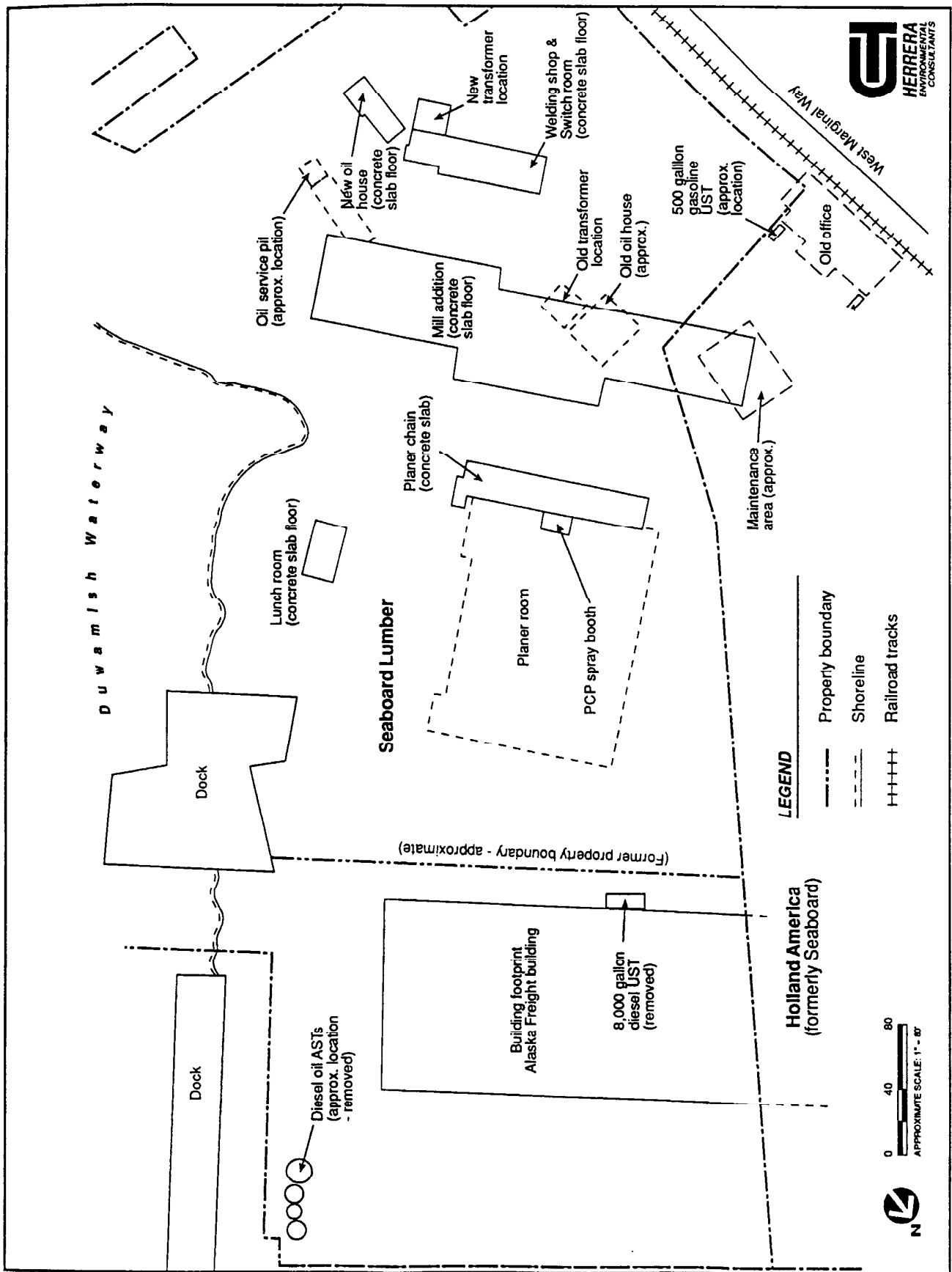


Figure 4

There is one occupied single family home and small-scale commercial uses (e.g., cargo/distribution centers, a compressed gas and wooden pallet storage yard, and a roofing company) at the base of the slope on the west side of W Marginal Way SW opposite the site. The steep slope of the Duwamish Greenbelt rises behind these properties.

### **Soils and Sediments**

**Topography:** The Seaboard Lumber site is a relatively flat bench above and adjacent to the west shoreline of the Duwamish Waterway. The steepest slopes occur at the shoreline bank, and range from 2H:1V to 1.5H:1V (horizontal to vertical).

**Geology and Soil/Sediment Types:** Near-surface geologic material beneath the site includes a variety of soil types, some of which may have been deposited as fill material during construction of the Duwamish Waterway. Other soils probably were deposited later during site grading and improvement activities. Potential sources of onsite soils include sediments from construction and maintenance dredging of the Duwamish River, roadcut material from construction of West Marginal Way SW, imported fill soils, and waste material generated from historic site operations.

Environmental site investigations conducted by Herrera Environmental Consultants in 1996 and 1997 encountered several stratigraphic units beneath existing ground surface, many of which are discontinuous. These include silt; shell-bearing silt and sand; undifferentiated fill soils consisting of silt, sand, gravel and wood layer mixtures; waste-bearing fills; an extensive sand unit present across much of the site; an extensive organic silt unit; and a dense silt and clay layer below approximately - 13 ft MLLW. Geologic cross sections are provided in the Phase III Site Investigation (Herrera Environmental Consultants, June 24, 1997). Waste-bearing fills were found to contain residual concentrations of chemicals, below regulatory limits and chemically stable within their existing context.

Extensive subsurface soil sampling was performed at 26 soil borings and 19 test pit locations by Herrera Environmental Consultants, as part of Phase II and Phase III Environmental Site Investigations (1996 and 1997). Contaminants investigated included petroleum hydrocarbons, metals, polychlorinated biphenyls (PCBs), pentachlorophenol, polycyclic aromatic hydrocarbons (PAHs), and phenols. Sample locations were distributed over eight suspected source areas associated with the former lumber mill operation, and more recent activities (also see Figure 5):

Table 1. Contaminants

| <u>SUSPECTED SOURCE AREA</u>                       | <u>CONTAMINANT</u>                               |
|--|--|
| • Fill soils near a former oil service pit         | Petroleum contaminated soils                     |
| • Former oil house                                 | Petroleum contaminated soils                     |
| • Former gasoline underground storage tank         | Petroleum contaminated soils                     |
| • Former anti-fungal spray booth                   | Pentachlorophenol and mercury-contaminated soils |
| • Former diesel underground storage tank           | Petroleum contaminated soils                     |
| • Fill soils around former Alaska Freight building | Petroleum, metals, and PAH-contaminated soils    |
| • Soil adjacent to new underground storage tanks   | Petroleum contaminated soils                     |
| • Portion of a recently-constructed storm drain    | Petroleum contaminated soils                     |

# CONTAMINANT AREAS (PREPARED BY SHANNON AND WILSON, INC.)

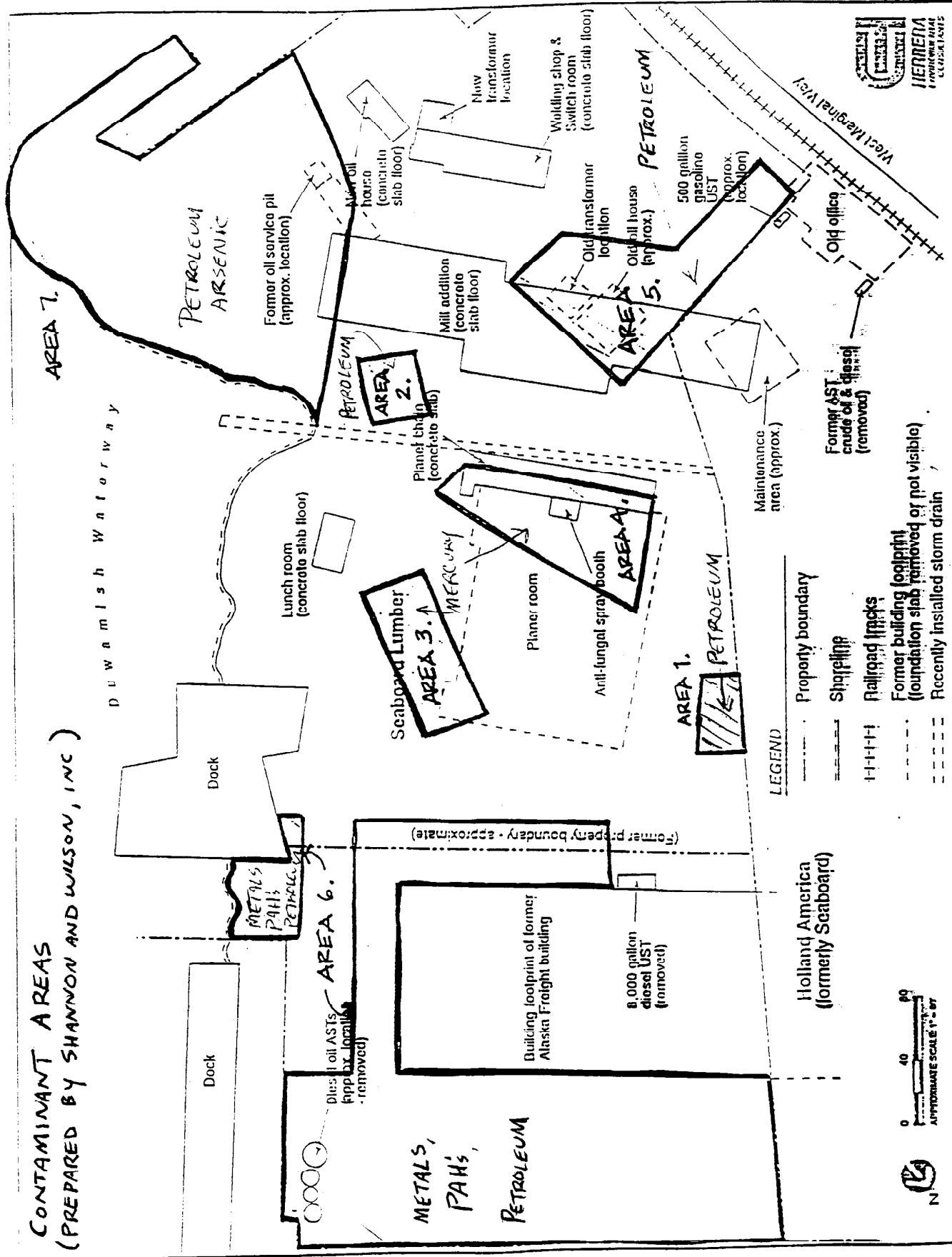


FIGURE 5.

Investigation of these locations identified approximately 25,000 to 30,000 cu yd (based on comparison to MTCA Method A cleanup levels) of soil containing residual concentrations of chemicals. Most of these soils occur in two areas near the north and south shoreline - the former oil service pit; and fill soil surrounding the former Alaska Freight building. Areas with smaller quantities of contamination include the former gasoline underground storage tank, former oil house, and former anti-fungal spray booth area. Approximately 12,400 cu yd of contaminated material will be excavated from these areas, removed, transported, disposed or recycled at a permitted upland facility.

Three areas of waste-bearing fill soils were identified on the site. These include: (1) an area at the west boundary of the site, near the southwest corner; (2) a deep (approximately 35 ft) area of fill placed to extend the shoreline eastward, near the former oil service pit; and (3) a large, shallow (3 to 6 ft) area in the northeast portion of the property between the former Alaska Freight building and the Duwamish Waterway. Fill material in these areas differs significantly in composition and appearance.

*Southwest Corner Area:* The area of waste-bearing fill near the southwest corner of the site contains alternating layers of sand, silt and gravel mixtures with wood debris.

*Southeast Shoreline; Former Oil Service Pit Area:* Fill soils in the former oil service pit area generally consist of gravelly sand and silt mixtures with broken rock, asphalt, brick, concrete, wood, and occasional metal debris, placed along the former shoreline around 1970. A wood layer ranging in thickness from 1 to 4.5 feet was encountered at depths ranging from 16 to 29 feet beneath the waste-bearing fill soil. The appearance of the wood suggests that it likely originated as woody debris from the mill, subsequently covered by the waste-bearing fill. There is approximately 13,000 to 15,000 cu yd of petroleum-contaminated soil in this area.

*Northeast Shoreline; Former Alaska Freight Building Area:* Fill soils in the vicinity of the former Alaska Freight building contain waste materials that appear to have originated from foundry operations, including refractory brick, slag fragments, and foundry sands. These wastes are generally present in a sandy or silty matrix with varying amounts of gravel. Fill thickness ranged from a few feet to approximately 12 feet deep near the shoreline, thickening toward the northeast. There are approximately 9,000 to 11,000 cu yd of soil containing petroleum hydrocarbons, metals and PAHs in the area surrounding the former Alaska Freight Building.

*Offshore Sediments:* Offshore sediment sampling was performed by Herrera Environmental Consultants (May 1996) during the Phase II Site Investigation. A total of 20 surface samples (0 to 10 cm) were collected, confirming that sediments are silts and clays. Contaminant investigations found low levels of contaminants in most of the sediments analyzed, usually at levels well below state sediment quality standards. The sediment quality standard for phenol was exceeded in one sample; the standard for zinc was exceeded in two samples; and low levels of PCB arochlors 1254 and 1260 were observed in most samples. Only the combined levels of these two arochlors in one sample (14.5 mg/kg) exceeded the state standard for total PCBs (12mg/kg).

A report prepared for the Washington Department of Ecology (GeoSea Consulting 1994) confirms that the offshore area waterward of the Seaboard Lumber site uplands is depositional in nature, and that the net transport direction is downstream with the river.

### **Water Quality**

**Surface:** The Duwamish Waterway forms the eastern boundary of the site. Duwamish River water will flush the proposed intertidal basin on every tide cycle. The site is at Rivermile 2, above the confluence of the Duwamish Waterway with Elliott Bay. Since the project is, by definition, aquatic habitat restoration, it necessarily involves integration with the existing shoreline environment.

Duwamish River water quality has been degraded over the years by discharges of municipal sewage, industrial wastes, stormwater runoff, and nonpoint source agricultural wastes. Corrective action has been taken during the past 15 years to decrease pollutant inputs to the river. Stormwater runoff (and combined sewer overflows – CSOs) are perhaps the most significant remaining sources of pollution.

Storm sewers nearest the Seaboard Lumber site, capable of combined storm and sanitary sewage overflows, are located across the river at Diagonal Way, south of the site beneath the First Avenue South Bridge, and north of the site at Chelan Street near the Duwamish West Waterway. CSO discharges may contain fecal coliform, polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs), metals, oil and grease (USACOE, May 1995). Sources of metals entering the estuary include runoff from industrial surfaces, and atmospheric deposition of particulates originating from smelters, ships, cement plants and cars. The metals of concern in the Duwamish are arsenic, cadmium, chromium, copper, iron, mercury, nickel, lead and zinc. Most metals are often found adsorbed to particulate matter, largely fine clay particles transported furthest downstream. Peak concentrations tend to occur near the mouth of the estuary.

Suspended sediments in freshwater flows settle in the oxbow region of the Seaboard site, so the site experiences less turbidity than the main channel, except during storm flows. This means that polluted sediments are not transported downstream and deposited at the site. Water temperatures are moderated by the cooler tidal influence. The pH fluctuates within acceptable ranges, and has returned to more neutral levels since diversion of the Renton Treatment Plant effluent in 1987. Because the site flushes well, dissolved oxygen does not fall below critical levels for fish. PCBs were not found in the water column. Heavy metals were either not found or were at very low levels. Nutrients were at levels high enough to support primary production in late summer, causing nuisance algal blooms (Seaboard Lumber Site Aquatic Habitat Restoration Analyses, USACOE, 1995).

**Groundwater:** Shallow groundwater occurs under generally unconfined (water table) conditions across the site. During environmental site investigations performed between November 22 and December 13, 1996, depth to groundwater ranged from approximately 2.5 feet below ground surface (bgs) in the southwest corner of the site, to 6.5 feet bgs in the northeast corner. In the middle and northern portions of the site, shallow groundwater in the sand unit is partly separated from deeper groundwater by the intervening silt unit, which serves as a perching layer. The direction of groundwater flow across the site is generally eastward during high-tide conditions, toward the Duwamish Waterway. During low-tide conditions, groundwater flow in the central portion of the

site appears to assume a more northeasterly direction of flow, whereas a southwesterly direction is indicated in the northwestern portion of the site (Herrera Environmental Consultants, May 1996).

Groundwater quality beneath the site was investigated at five monitoring well locations by Herrera Environmental Consultants (June 24, 1997). All wells were screened for floating product, and none was observed. It appears that the mobile constituents of known contaminants on the site are no longer present.

### **Plants**

Most of the site is devoid of vegetation, with the exception of sparse areas of upland invasive species that include Himalayan blackberry (*Rubus discolor*), teasel (*Dipsacus fullonum*), common tansy (*Tanacetum vulgare*), and Scot's broom (*Cytisus scoparius*).

Three wetland areas were identified within the project vicinity by Adolfson Associates, Inc. (January 22, 1998): one small wetland in the northeast portion of the Seaboard Lumber property, the Duwamish Waterway, and offsite intertidal wetlands to the south, on Port of Seattle Terminal 107 property.

**Onsite Wetland:** The small onsite wetland is located at the top of the river bank adjacent to an existing timber dock (see Figure 3). Dominant vegetation includes gumweed (*Grindelia integrifolia*) and saltgrass (*Distichlis spicata*). The wetland is approximately 400 sq. ft or less in size, classified as an estuarine intertidal beach/bar wetland. The functional attributes of this wetland are ranked low in quality (Adolfson Associates, Inc., February 1998) due to its small size, paved buffer, and rip-rap shoreline.

**Duwamish Waterway:** The bank of the Duwamish Waterway within the project area is steep, rip-rapped, and unvegetated. The river bottom below the bank also lacks vegetation. It is likely that the frequency and depth of inundation precludes the establishment of vascular vegetation in this area. Duwamish Waterway wetland functions and values have been degraded by past human activities that have reduced flood control capacity, water quality and wildlife habitat.

**Terminal 107 Estuarine Intertidal Wetlands:** The Terminal 107 shoreline adjacent to the south boundary of the Seaboard Lumber site is gently sloped, and covered by a significant amount of woody debris washed ashore in this area. Dominant vegetation consists of saltgrass, hard-stemmed bulrush (*Scirpus acutis*), and fat-hen (*Atriplex patula*). The intertidal area below +2 feet MLLW does not support wetland vegetation. Due to the small size of the Terminal 107 estuarine intertidal wetland, and the surrounding degraded shoreline, its wetland functions and values are limited.

Blackberry, Scot's broom, and other weedy, invasive species will be cut or pulled out prior to site plantings, in order to minimize competition with desired upland species.

There are no rare plants, high quality native wetlands, or high quality native plant communities in the vicinity of the Seaboard Lumber site (correspondence received from the Washington Department of Natural Resources, Natural Heritage Information System, January 31, 1995).



### **Animals**

The Seaboard Lumber site was not specifically investigated for use by birds or mammals. The highly disturbed condition of the site offers little or no cover, and sparse foraging opportunities in the blackberry, teasel, tansy and Scot's broom along the shoreline and fence lines.

**Birds:** A biological investigation was recently conducted at Terminal 107 (Parametrix, Inc., January 22, 1995), adjacent to the Seaboard Lumber site on the south. Bird species observed or reported on the Terminal 107 upland are common species that inhabit urban areas: red-tailed hawk, American kestrel, song sparrow, house finch, dark-eyed junco, rufous-sided towhee, and black-capped chickadee. Species reported during an extensive wildlife study of the site in 1977-1978 included Canada geese, California quail, killdeer, common snipe, robin, starling, red-winged blackbird, brown-headed cowbird, and house finch (Oceanographic Institute of Washington, in association with Northwest Environmental Consultants, Inc., 1979). These species are likely to continue to utilize the project area.

Waterbirds observed by Parametrix, Inc. in the adjacent Duwamish Waterway and on Kellogg Island on January 22, 1995 included red-breasted merganser, mallard, double-crested cormorant, western grebe, belted kingfisher, scaup, Canada geese, horned grebe, Barrow's goldeneye, American coot, glaucous-winged gull, and redhead ducks. Waterbirds observed in the same area during the 1977-1978 year-long study included all of these same species and others: red-throated loon, pied-billed grebe, great blue heron, green heron, gadwall, pintail, green-winged teal, blue-winged teal, American widgeon, shoveler, canvasback, common goldeneye, bufflehead, hooded merganser, common merganser, spotted sandpiper, greater yellowlegs, least sandpiper, dunlin, dowitcher, western sandpiper, herring gull, Thayer's gull, ring-billed gull, mew gull, Bonaparte's gull, California gull, and common murre. These birds would be expected to continue to utilize the Duwamish Waterway at varying times of the year. The waterway provides important foraging habitat for many species of waterfowl, sandpipers, and gulls.

Osprey use of the Duwamish Waterway is not uncommon. A pair constructed a nest during the 1996 breeding season on top of a yard light pole at the water's edge, approximately 120 feet from the northeast corner of the Seaboard Lumber property. The nest is located in an active marine industrial area. Osprey have a "monitor" status in Washington state, but no federal listing status. The federal Migratory Bird Act protects their nest sites from removal. WDFW notes that pairs choosing to nest in or near areas frequented by humans tend to be more tolerant of human activities than nesting pairs in more natural habitats. WDFW management recommendations (1991) include restricting human activity within 660 feet of an active osprey nest between April 1 and October 1.

**Mammals:** There is no reported residency or regular occurrence of mammals on the Terminal 107 upland or Seaboard Lumber site in recent years; however, a California sea lion was heard in the Duwamish Waterway, and river otter and raccoon tracks were seen along the Terminal 107 shoreline during a January 22, 1995 biological investigation by Parametrix, Inc. A snowshoe hare was observed on the site during the 1977-1978 wildlife study; and raccoon, Townsend vole, muskrat and Norway rats were observed on Kellogg Island (Oceanographic Institute of Washington, in association with Northwest Environmental Consultants, Inc., 1978).

**Fish:** The *Terminal 105 Aquatic Environment Technical Report* (Taylor Associates, January 1994) describes fish and shellfish use of the lower Duwamish waterway based on a review of several studies by others. These studies report that adult salmonids migrate upstream through the Duwamish River throughout the year. The Pacific salmon species (chinook [*Oncorhynchus tshawytscha*], chum [*O. keta*], and coho [*O. kisutch*] salmon) migrate upstream during late summer, fall, and early winter. Steelhead trout (*O. mykiss*) migrate in both winter and summer runs. Small numbers of sea run cutthroat trout (*O. clarki*) and Dolly Varden trout (*Salvelinus malma*) are other important anadromous salmonids that migrate through the Duwamish Estuary.

Adult chinook commence to enter the estuarine part of the Duwamish River in early July. Upstream chinook migration in the river typically peaks in the last week of August-first week of September. Most chinook have left the estuary by the end of September. Adult coho enter the estuary from late August through the end of October-beginning of November. There is no defined peak to the number of coho migrating upstream, instead there is a series of peaks. Chum are typically found in the estuary from the end of October through the middle of December. A winter steelhead run of mostly hatchery origin is present from late November through early February. From early February to April, a natural winter steelhead run occurs. From May through July a summer steelhead run of hatchery origin is found in the estuary. Spawned out winter run steelhead and kelts, migrating back to the ocean, are found in the estuary from January through July.

Recent work regarding the distribution and timing of juvenile salmon in the Duwamish Estuary was conducted in 1994 by the Muckleshoot Indian Tribe Fisheries Department (Warner and Fritz, 1995). Additional field work conducted in 1995 and 1996 supplemented and confirmed the 1994 results. This study showed that juvenile chinook are found in the estuary from mid-February through early September with the peak in mid to late May. This peak is typically concurrent with releases of juvenile chinook from the WDFW Soos Creek Hatchery. The greatest densities of juvenile chinook salmon are found at approximately river mile 7.5 and at Kellogg Island (river mile 1.6) adjacent to the Seaboard site. Juvenile chum are found from late February to mid-July. Chum abundance is multi-modal following trends in river flow. Juvenile coho are present in low numbers from mid February until they peak in early May as a result of hatchery releases, then persist in low numbers until no longer observed in mid-June. Few steelhead were recovered; however, it appears juvenile steelhead migration through the estuary peaks in early May.

### **Endangered Species**

The Washington Department of Fish and Wildlife, Priority Habitats and Species Program (PHSP) was contacted concerning potential utilization of the Duwamish Waterway and associated uplands by state-listed species (WDFW, January 31, 1995). The map indicates the occurrence of California sea lion in the vicinity of the north end of Harbor Island and both waterways. In addition, a great blue heron rookery is identified on the east slope of the West Duwamish Greenbelt. These nests are in trees near the top of the slope, above Allied/Continental Van Lines at 4501 W Marginal Way SW, opposite the Holland America property. Great blue heron are a Washington State protected species, and their breeding and nesting areas are priority habitats. Implementation of the Seaboard Lumber Site Aquatic Habitat Restoration Project is not expected to significantly increase the level of

disturbance to the great blue heron rookery caused by commercial and industrial activities in the W Marginal Way SW corridor.

Recent evaluations of threatened, endangered, or sensitive (TES) species in the project vicinity were conducted for the *Southwest Harbor Cleanup and Redevelopment Project Biological Assessment* (Parametrix 1994). The biological assessment addressed four threatened or endangered species of concern potentially occurring in Elliott Bay or the Duwamish Waterway and vicinity: bald eagle, marbled murrelet, Stellar sea lion, and gray whale (*Note: Western Pacific gray whales, which seasonally migrate along the Washington coast, are no longer federally listed as endangered [Federal Register, Volume 58, No. 4, January 7, 1993].* Marbled murrelet and Stellar sea lion are marine species that have not been observed in the Duwamish River. Only wintering bald eagles (threatened status) have a confirmed seasonal presence in the Southwest Harbor project vicinity, which is approximately 2 miles north and west of the Seaboard Lumber site. Field observations for TES species were conducted on 10 days between February 28 and April 6, 1994. Bald eagles were observed perching on tall trees west of Harbor Avenue SW (near its intersection with Fairmont Avenue SW), standing on the pier decks of the Lockheed Shipyard No. 2 site, and perching on dolphins north of the Lockheed piers. Adults and juveniles demonstrated a high tolerance for human activity.

An addendum to the *Biological Assessment* (Parametrix, Inc., January 1996) reports nest construction by a pair of bald eagles in a small grove of trees southwest of the intersection of Harbor Avenue SW/Fairmount Avenue SW in December 1994. The pair successfully raised one eaglet during 1995, and one or two eaglets in 1996. Now identified as Duwamish Head Bald Eagle Territory #1023, the nest site was evaluated for potential impacts from cleanup and redevelopment actions, and marine facility improvements in the Southwest Harbor area. The addendum cites bald eagle behavior research that indicates typical construction activities, including grading and excavation, operation of heavy equipment, and building work, at a distance greater than 2,600 ft does not disturb eagles (USFWS 1986; Anthony and Isaacs 1989). The Seaboard Lumber site is approximately 2 miles further south and east from the nest site than the location for which this conclusion was drawn. In addition, the proposed project location is not within sight of the eagle nest, separated by Pigeon Point and the West Seattle Freeway high-level bridge.

Parametrix (1994) also investigated the potential occurrence of three candidates for listing as a threatened species or subspecies: bull trout (*Salvelinus confluentus*), northern red-legged frog (*Rana aurora aurora*), and northwestern pond turtle (*Clemmys marmorata marmorata*). Due to the absence of moist forest habitat, riparian habitat, or freshwater pools associated with the Southwest Harbor project area, red-legged frogs and northwestern pond turtles are not expected to be present. The Muckleshoot Fisheries Department 1994 survey recovered one bull trout near river mile 5.2 (Warner and Fritz, 1995).

Three waterfowl species of interest to the Washington Department of Fish & Wildlife (WDFW) may occasionally utilize the Duwamish Waterway in the vicinity of the Seaboard Lumber site. The common loon (a WDFW candidate species), red-necked grebes and great blue herons (WDFW monitor species) are known to utilize the Duwamish Waterway in the vicinity of Terminal 105, the Seaboard Lumber site, and Terminal 107.

The Duwamish Waterway is a significant migratory route for anadromous salmonids in the Green River basin. Both adults returning to spawn and juveniles heading to sea use the Waterway for migration. A letter from the National Marine Fisheries Service (March 2, 1998, see Appendix I) listed Puget Sound chinook salmon (*Oncorhynchus tshawytscha*), known to be in the project area, as proposed for federal listing as a threatened species. Hood Canal summer chum (*O. keta*), proposed as threatened, and candidate species coho salmon (*O. kisutch*), and sea-run cutthroat trout (*O. clarki clarki*) may also range in the project area.

Peregrine falcon (federally listed as an endangered species) have been observed foraging along the Seattle Waterfront and westward to Alki Point (including up the Duwamish Waterway). Eight to 10 peregrine wintered in the area in 1996, with known roosts, perches, and hunting territories: the Washington Mutual Tower pair downtown; the Interstate 5 Freeway Bridge lone female, courted by a young adult male; the Terminal 91 lone female; and miscellaneous individuals in the vicinity of the West Seattle Freeway Bridge and Terminal 86 grain loading facility (personal communication with Ruth Taylor, Falcon Research Group, March 19, 1997). Peregrines forage for pigeons and starlings which are abundant around Terminal 86 north of the central waterfront, and around Fisher Flour Mills, on the west side of Harbor Island. They also hunt shorebirds and small ducks such as those that utilize Elliott Bay and the Duwamish Waterway. A regular observer of the Seattle area peregrine falcon population indicates that Seattle is transitioning from having only wintering peregrines to a resident population of these birds (personal communication with Ruth Taylor, Falcon Research Group, March 19, 1997). The U.S. Fish & Wildlife Service has provided a letter (March 6, 1998, see Appendix I) that states that spring and fall migrating peregrine falcons may frequent the project area.

#### **Historical and Cultural Site Aspects**

The nearest site listed on the National Register of Historic Places is the Duwamish No. 1 Site (45KI23), a shell midden with prehistoric and historic-period components. BOAS, Incorporated, obtained information regarding feature distribution and matrix characteristics during backhoe trenching in the Renton Effluent Transfer System (RETS), sewage transfer pipeline right-of-way, adjacent to the east side of W Marginal Way SW (URS Corporation and BOAS, Incorporated, 1987).

A pit feature was recorded north of SW Alaska St., which extended the northern boundary of the Duwamish No. 1 site approximately 26 feet north of the center of SW Alaska St. This extension of the Duwamish No. 1 site occupies the southwest corner of the Seaboard Lumber site. URS and BOAS, Incorporated (1987) conducted archaeological data recovery excavations in the northwest corner of the Duwamish No. 1 Site (45KI23) in 1986 as part of the RETS project. Intact cultural deposits were identified in the SW Alaska St. right-of-way and on the north edge of SW Alaska St., which suggests that cultural deposits are buried beneath this portion of the Seaboard Lumber Site Aquatic Habitat Restoration project area (see Figure 6).

According to the technical report prepared by Larson Anthropological Archaeological Services (LAAS) in March 1998, the Duwamish No. 1 Site was listed in the National Register of Historic Places in October, 1977 for its scientific importance. Archaeological testing conducted in 1977 indicated that the midden comprises at least two separate occupations, one dating to about 1,300 years ago, and the second dating to the 19th century. Later research showed that the Duwamish No. 1 site was occupied between about AD 15 and AD 1775 by Native Americans, and again

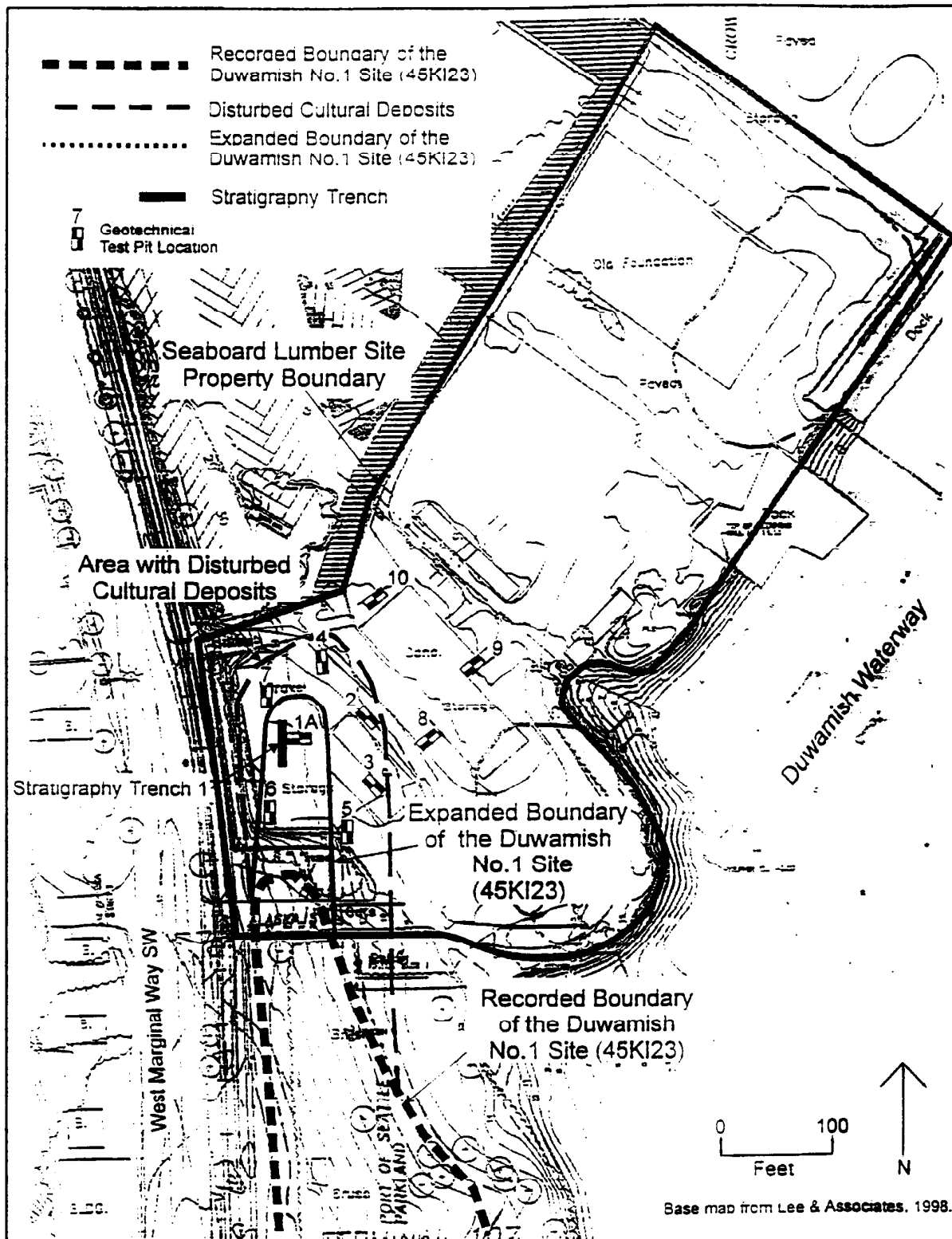


Figure 6. Project area showing the recorded Duwamish No.1 Site (45KI23) site boundary and associated intact and disturbed cultural deposits identified within the Seaboard Lumber Site Aquatic Habitat Restoration Project Area during archaeological field reconnaissance.

between 1890 and 1970 by Euro-american settlers and their descendants. Biological remains (mainly fish bones, mammal bones, and shell), artifacts, and features excavated at the site have provided valuable information regarding prehistoric settlement and subsistence systems. The significance of the historic-period component (i.e., residential neighborhood) has not yet been assessed.

LAAS identified intact cultural deposits associated with the Duwamish No. 1 Site (45KI23) in the southwest corner of the Seaboard Lumber Site Aquatic Habitat Restoration project area on January 15 and 16, 1998. Intact hunter-fisher-gatherer cultural shell midden deposits were identified in two geotechnical test pits. Disturbed cultural deposits were found in five additional test pits, and consisted of a mixture of hunter-fisher-gatherer shell midden deposits and historic period fill. Based on stratigraphic position above a natural geological marker bed uplifted approximately 1,100 years ago, matrix grain size, matrix color, and midden content, the intact hunter-fisher-gatherer shell midden deposits in two of the test pits appear to be an extension of the Duwamish No. 1 Site shell midden cultural deposits. LAAS estimates that intact cultural deposits encompass an area approximately 7,590 sq. ft within the Seaboard Lumber property.

#### **Transportation**

West Marginal Way SW is a five-lane principal arterial where it passes the Seaboard Lumber site. The five lanes include two lanes of travel in each direction, plus a center two-way left-turn lane. The posted speed limit is 40 mph. Traffic volumes on West Marginal Way SW were approximately 900 vehicles per hour in the AM peak hour, and 1,100 in the PM peak hour, when last reported in 1995 (TDA, Inc., February 8, 1995). There is currently no north-south transit service on West Marginal Way SW past the Seaboard Lumber site.

#### **Public Use**

Waters in the vicinity of Harbor Island (Elliott Bay and the Duwamish East and West Waterways) are Treaty-protected "usual and accustomed" fishing areas. Fishing activity in these areas is managed by the Muckleshoot and Suquamish Tribes, and the Washington Department of Fish and Wildlife (WDFW). Fishing by Tribal members in these areas is consistent with past federal government treaties (the treaties of Point Elliott and Medicine Creek), and subsequent federal court decisions. Treaty fishing is an ongoing activity, and thus a baseline condition within these areas.

Members of the Muckleshoot and Suquamish Tribes harvest chinook, coho, chum, and steelhead salmon in the Elliott Bay/Duwamish traditional fishing areas during late summer, fall, and winter of each year, from August through December, and in January of the new year. Treaty Indian fishermen use drift gillnets in Elliott Bay, and set gillnets together with specialized drift gillnets in the Duwamish East and West Waterways. Set nets are often attached to structures or objects along the shoreline or other shoreline features, and extend into the channel, with the waterward end of the net fixed by an underwater anchor. Set nets are restricted from occupying more than one-third the width of the netted waterway, measured from each bank line. Drift and set gillnets typically float at the surface, with the bottom edge of the net extending vertically in the water column as a curtain. Drift gillnets are attended by a fisherman at all times, while set gillnets may be left in place and unattended (personal communication, Muckleshoot Tribe).

By virtue of its location on the Duwamish Waterway, the submerged lands of the Seaboard Lumber site are within the Tribal treaty fishing areas described above. The proposal to place approximately 7,000 cu yd of fill in the nearshore area of the site to create shoreline protection and a gradual slope to the top of barrier spits will alter existing conditions in an area where Tribal treaty fishing rights exist. Members of both the Muckleshoot and Suquamish Tribes have participated throughout the project planning process as members of the Elliott Bay/Duwamish Restoration Panel, and correspondence with maps and proposed fill quantities were submitted to the Tribes for review and comment prior to preparation of permit applications for the project.

The aquatic habitat restoration project will have minimal utility requirements. Electricity may be extended to the proposed informational kiosk to provide low-level lighting. A temporary water supply may be required on the site to provide establishment-period irrigation to upland plantings. These utilities are available at the site boundary as a result to prior industrial uses. Construction activities to extend these minor services would be insignificant.

### **3.0 Project Alternatives**

Based on the criteria set out in the Concept Document, six project alternatives were evaluated by the EBD RP. These alternatives were developed early in the project consideration phase, to assess the feasibility and desirability of acquiring the Seaboard Lumber property. Site plan alternatives were linked to three potential remediation scenarios developed by Herrera Environmental Consultants in the Level I, Level II, and Level III Site Assessment Reports. The conceptual alternatives are described below, based on the understanding that there are three major areas of soils on the site with residual concentrations of chemicals, as identified in the Level III Report. Remediation scenarios considered range from:

- Total removal of areas of residual contamination.
- Partial removal and isolation of areas of residual contamination.
- Leaving soils with residual concentrations of chemicals in place, and covering them with clean soil.

#### Alternatives Screening Criteria

- Use the entire Seaboard Lumber property, including the waterward boundaries.
- Take advantage of hydraulic connection to the Duwamish Waterway as a source of sediment, organic matter, plant material for natural colonization, and fish access.
- Construct shoreline protection with a hydraulic opening to protect habitat features from erosion by boat wakes, while providing tidal inundation to an excavated intertidal basin.
- Provide for desired habitat goals and functions, to include upland riparian community, high and low emergent marsh, intertidal mudflat, and nearshore subtidal soft bottom substrate.
- Prioritize one habitat to improve chance of success in establishing this habitat type and its associated functions on the small site.
- Provide upland habitat with varied structure and composition to attract wildlife to the site.
- Attain a balance and interface between upland and estuarine habitats to maximize benefits to various target species.

- Note existing grades, habitat types, and established vegetation in the project vicinity (e.g., at Terminal 107 and Kellogg Island), and use these parameters as a guide for Seaboard Lumber site aquatic habitat restoration features.
- Take into account the natural dynamics of the site (hydrology, hydraulics, sediment composition, slope, rate of sedimentation) to anticipate the most stable condition after construction.
- Augment upland soils and offshore sediments (possible) to develop suitable substrate.
- Implement early control and maintenance measures to discourage the establishment of invasive species, and/or the loss of plantings (e.g., goose exclusions).
- Implement a monitoring plan to facilitate the success of the project.
- Preserve the function of an existing storm drain through the site. The elevation of the storm drain is below proposed excavation; however, the pipe would need to be extended in any alternative that included placement of nearshore fill for shoreline protection.

In addition to the above criteria, additional factors were considered to fulfill the intent of the NEPA review process. These factors are (40 CFR, 1508.27):

- Likely impacts of the proposed project.
- Likely effects of the project on public health and safety.
- Unique characteristics of the geographic area.
- Controversial aspects of the project or its likely effects on the human environment.
- Degrees to which possible effects of implementing the project are highly uncertain or involve unknown risks.
- Precedential effect of the project on future actions that may significantly affect the human environment.
- Possible significance of cumulative impacts from implementing this and other similar projects.
- Effects of the project on National Historic Places, or likely impacts to significant cultural, scientific, and historic resources.
- Degree to which the project may adversely affect endangered or threatened species or their critical habitat.
- Likely violations of environmental protection laws.

### **3.1 Alternative 1: No Action/Natural Recovery**

The No Action/Natural Recovery Alternative would involve no remedial action at the site. Contaminated soils would remain at the site. No habitat restoration activities would occur onsite, and no long-term monitoring would be performed using EBD RP settlement funds. The No Action/Natural Recovery Alternative allows biological impacts to recover naturally. In order for natural recovery to be selected as the preferred alternative (1) the natural process must be more effective in restoring the environment than available or potentially available restoration options and alternatives; (2) the time to recovery must not be significantly different from that resulting from human intervention; (3) the affected area will not suffer from additional adverse ecological effects before the site returns to a natural state; (4) no negative threats to the health and safety of the general public will be caused by the time lag of natural recovery; and (5) funds are not available for restoration.



### **3.2 Alternative 2: Total Removal of Areas of Residual Contamination, Maximum Upland Excavation and Intertidal Filling, With Barrier Islands**

Alternative 2 would be characterized by completely removing soils with residual concentrations of chemicals and developing the maximum extent of intertidal habitat. One large continuous bay of intertidal habitat would be created from existing upland, intertidal and subtidal areas of the site. Shore protection would be provided by constructing barrier islands. An extensive amount of dredged material would be placed in intertidal and subtidal areas to create mud-flats at more desirable elevations for improved habitat.

### **3.3 Alternative 3: Total Removal of Areas of Residual Contamination, Maximum Upland Excavation, No Intertidal Filling**

Under Alternative 3, soils with residual concentrations of chemicals would be completely removed, and the maximum extent of intertidal habitat would be excavated. One large continuous bay of intertidal habitat would be created from the existing upland, intertidal and subtidal areas of the site. No intertidal or subtidal areas would be filled.

### **3.4 Alternative 4: Total Removal of Areas of Residual Contamination, Maximum Upland Excavation and Intertidal Filling, With a Protective Spit**

Alternative 4 is the same as Alternative 2, except that shore protection would be provided by constructing a spit instead of barrier islands. Upland or beach vegetation could be developed on the spit. Vegetation on the spit could offer some intertidal habitat shading, erosion control, and aesthetic enhancement, and visual screening.

### **3.5 Alternative 5: Partial Removal of Areas of Residual Contamination, Moderate Upland Excavation and Intertidal Filling, With Barrier Islands**

Under Alternative 5, soils with residual concentrations of chemicals would be partially removed and covered with 1 to 2 feet of clean soil, over which habitat and park improvements would be constructed. Two lobes of intertidal habitat would be created. Fill would be placed to construct islands to protect an excavated basin and the shoreline from wave erosion. An upland riparian buffer would extend out over areas of waste-bearing soils and around the perimeter of the marsh area. A small parking lot and short foot paths would be constructed to allow limited visitor use for educational purposes.

### **3.6 Alternative 6 (Preferred Alternative): Partial Removal of Areas of Residual Contamination, Moderate Upland Excavation and Intertidal Filling, With Protective Spits**

Alternative 6 is similar to Alternative 5, except that fill would be placed to construct two vegetated spits (instead of islands) to protect the excavated basin and the shoreline from wave erosion, provide the optimum hydraulic flushing of the new basin, and to act as erosion-protection caps to remaining concentrations of soils with residual contamination and buried waste material.

#### **4.0 Environmental Consequences of the Project Alternatives**

The goal of the project is to control contaminated soil and add intertidal and riparian habitats to the last remaining oxbow bend area of the Duwamish River. By necessity, excavation of soils, placement of fill, armoring of remaining residually-contaminated soils with quarry stones or rip-rap, connecting a new basin area to the river, and landscaping activities are all integral parts of the action alternatives. During the construction process, there will be a potential for short-term impacts to the environment, but these will be more than offset by the addition of new habitat and the control (or outright removal) of contaminated soils.

Executive Order 12898 (E.O. 12898), Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was taken into account during the review of the project alternatives. This Executive Order requires each federal agency to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations. Among other actions required by E.O. 12898, each federal agency is required to identify differential patterns of consumption of natural resources among minority and low income populations which may be affected by agency actions. E.O. 12898 specifically mandates that federal agencies collect, maintain, and analyze information on consumption patterns of populations who rely principally on fish and/or wildlife for subsistence.

The Muckleshoot Indian Tribe and the Suquamish Tribe constitute distinct, separate communities of Native Americans who rely on Treaty-reserved fish and shellfish resources of Elliott Bay and the Duwamish River. Both Tribes are represented on the EBD RP Panel and are involved in the decision-making process for this and other EBD RP projects, under the guidelines of the Concept Document. EBD RP Panel members have not identified any disproportionate adverse impacts on human health or environmental effects on implementation of the action alternatives on members of either Tribe or other minority or low income population.

#### **4.1 Potential Impacts on Soils and Sediments**

**Alternative 1:** This alternative would not disturb the soils or sediments, leaving in place all residually-contaminated soils and waste materials. Human or animal disturbances to the surface layers of the site or changes in groundwater movement could lead to potential environmental exposure to the contaminants found in the Phase II and Phase III site investigations.

**Alternative 2:** This alternative would remove all contaminated soils, maximizing the area excavated for an intertidal basin. There would be a temporary risk of exposure to contaminated materials through airborne dust particles, stormwater runoff, or human and animal disturbances during the excavation process. Contaminated materials would be transported to an approved disposal site, increasing the potential for accidental exposure. There would be a period of temporary turbidity of the waters during the intertidal fill process. Existing benthic plant and animal communities would be covered by fill materials, but residually contaminated sediments would be covered.

**Alternative 3:** The impacts would be the same as Alternative 2, but temporary turbidity would be greatly diminished and existing benthic plant and animal communities would remain uncovered. Residually contaminated sediments in the nearshore area would remain uncovered.

**Alternative 4:** The same impacts as Alternative 2.

**Alternative 5:** Smaller amounts of contaminated materials would be excavated and transported to an approved disposal site, diminishing the risk of accidental exposure. Some contaminated material may be placed onsite under newly-created upland berms and capped with clean material to prevent exposure. The remaining contaminated soils in the excavation area would be capped and protected from human, animal, or environmental exposure. There would be temporary turbidity during the intertidal fill process, and existing benthic plant and animal communities would be covered under the fill. Residually contaminated sediments would be covered by the fill. Protective islands would allow a greater amount of debris to collect and possibly remain in the excavation (basin) area.

**Alternative 6:** The impacts would be the same as Alternative 5, with the exception that protective spits (instead of islands) would diminish the chance of debris deposition in the basin area.

## **4.2 Potential Impacts on Air Quality**

**Alternative 1:** Wind-blown contaminated particulates picked up from surface soils could impact human and animal health.

**Alternatives 2-6:** There will be construction vehicle and marine vessel exhaust emissions to the air during earthwork activities on the site. It is possible that some aspects of the earthwork could also result in dust (suspended particulates) during the construction period of this activity. The amount of dust generated will be affected by weather and the season of the year in which this work is performed. A 12-month construction period is estimated.

## **4.3 Potential Impacts on Water Quality**

### *Surface Water:*

**Alternative 1:** Creosote-treated pilings continue to decompose and leach contaminants into the sediments and the water. Contaminants in the soils could be disturbed through human or animal activity and migrate into surface waters. By taking no action, the natural recovery of this site could take hundreds of years, if it is at all possible. Chronic release of contaminants poses a threat to human health and the environment.

**Alternative 2:** The removal of creosote-treated pilings in the intertidal and subtidal areas of the site could result in the exposure of contaminated sediments immediately around the piles. Placing clean sediments around the base of each pile and allowing it to fall back into the hole during removal could help minimize exposure. There could be an accidental small spill of petroleum products while refueling vehicles during the construction process. These products could potentially enter the river. Contaminated dust from construction could settle into the water, and it is expected that temporary turbidity would increase as fill is placed at the site. There may be some localized turbidity after construction, as the sediments in the basin will take some time to stabilize.

**Alternative 3:** Same impacts as Alternative 2, with the exception that turbidity would be decreased because no fill would be placed in the waters.

**Alternative 4:** Same impacts as Alternative 2.

**Alternative 5:** Same impacts as Alternative 2.

**Alternative 6:** Same impacts as Alternative 2.

#### *Groundwater:*

All of the action alternatives require the excavation (and connection to the river) of much or all of the existing upland portion of the site. Creating an intertidal basin into the existing shoreline could provide a salt-water egress further into the adjoining soil strata. There are no known freshwater wells in the immediate area. Groundwater movement is generally towards the river. Any saltwater intrusion would likely be minimal and remain localized.

**Alternative 1:** The site remains as is; no changes to existing groundwater flow or quality.

**Alternative 2:** Removing the existing surface soil layers and cement pads during excavation will expose buried waste and contaminants to the environment. Contaminants might be free to move with existing groundwater flows and enter the river. This potential impact would only exist until all contaminated material is excavated. Since the groundwater flow is generally towards the river, any groundwater contamination due to excavation would likely be localized and temporary. Control measures (aggressive pumping) could reduce or eliminate this threat.

**Alternative 3:** Same impacts as Alternative 2.

**Alternative 4:** Same impacts as Alternative 2.

**Alternative 5:** Same impacts as Alternative 2, with the exception that only shallow excavations of the contaminated materials would occur. This would be followed by back-filling with clean material and armoring with quarry stones to prevent erosion. Any contaminated materials placed under upland berms would be capped with clean soil materials. Accidental exposure to the environment would be of a shorter duration than the other action alternatives.

**Alternative 6:** Same impacts as Alternative 5.

#### *Stormwater Runoff:*

**Alternative 1:** The site remains as is, with uncontrolled stormwater runoff moving across the site and entering the groundwater and the river.

**Alternative 2:** Accidental stormwater runoff from the site may occur during construction. After construction is completed, onsite stormwater runoff will be greatly reduced because most of the site will have been excavated for the intertidal basin. Remaining buffers around the basin could be designed to provide some protection from offsite runoff entering the basin.

**Alternative 3:** Same impacts as Alternative 2.

**Alternative 4:** Same impacts as Alternative 2.

**Alternative 5:** Accidental runoff from the site may occur during construction. There would be runoff from the parking lot and short footpaths after project completion, but this runoff would be channeled into bio-swales to mitigate any petroleum products or other contaminants associated with vehicles using the parking lot. There would be some naturally occurring runoff from the riparian buffer into the basin, but this would bring organics and plant debris into the basin to benefit desired animal and plant communities.

**Alternative 6:** Same impacts as Alternative 5.

## **4.4 Potential Impacts on Plants**

**Alternative 1:** Human or animal disturbances to onsite soils could result in the release of contaminants which, over long periods of exposure, might affect nearby plant communities at the adjacent T-107 restoration site or at nearby Kellogg Island. Wind-blown dust from contaminated

soils could affect nearby plant communities. Decomposing creosote-treated pilings would continue to release contaminants into sediments and water, which could eventually affect nearby plant communities and foraging animals.

**Alternatives 2-6:** There could be an accidental release of contaminants during the construction process, but this would only result in a temporary exposure and would not constitute a serious threat to the health of nearby plant communities.

#### **4.5 Potential Impacts on Animals**

**Alternative 1:** Human or animal disturbances to onsite soils could result in the release of contaminants which, over long periods of exposure, might affect animals using the adjacent T-107 restoration site or at nearby Kellogg Island. Wind-blown dust from contaminated soils could also affect animals. Decomposing creosote-treated pilings would continue to release contaminants into sediments and water, which could eventually affect fish and other wildlife.

**Alternative 2:** It is anticipated that the noise from the construction activities could cause temporary disturbances to any wildlife in the immediate vicinity. The deposition of fill materials (angular rock, cobbles, and finer soil material) to protect the new shoreline slope configuration will cover existing river bottom, covering any benthic and epibenthic species found there. Removal of creosote-treated pilings could result in temporary wildlife exposure to contaminated sediments. Increased turbidity from fill materials could cause a temporary avoidance of the area by marine organisms. Exposure to accidental releases of contaminated runoff or groundwater during construction could adversely affect wildlife.

**Alternative 3:** Same impacts as Alternative 2, with the exception that there would be less turbidity and no covering of benthic or epibenthic animals.

**Alternative 4:** Same impacts as Alternative 2.

**Alternative 5:** Same impacts as Alternative 2.

**Alternative 6:** Same impacts as Alternative 2.

#### **4.6 Potential Impacts on Endangered or Threatened Species**

**Alternative 1:** Implementing the No Action/Natural Recovery Alternative would result in no added or enhanced habitat for salmonids or other threatened or endangered species. There would be a loss of opportunity to add to the habitat areas found at nearby Kellogg Island and the adjacent T-107 site. Uncontrolled stormwater runoff, contaminated soils, and creosote-treated pilings could affect threatened or endangered wildlife.

**Alternative 2:** There would be temporary turbidity and downstream sediment loading during the fill process and as the new intertidal basin stabilizes. Noise and emissions from construction vehicles could temporarily disturb nearby wildlife. Excavation could result in an accidental small release of waste materials or contaminated soils into the river or air.

**Alternative 3:** Same impacts as Alternative 2.

**Alternative 4:** Same impacts as Alternative 2.

**Alternative 5:** Same impacts as Alternative 2.

**Alternative 6:** Same impacts as Alternative 2.

#### **4.7 Potential Impacts on Cultural and Historic Aspects of the Site**

**Alternative 1:** There would be no disturbances to the cultural deposits on the site.

**Alternative 2:** All cultural deposits found onsite would be excavated.

**Alternative 3:** Same impact as Alternative 2.

**Alternative 4:** Same impact as Alternative 2.

**Alternative 5:** The extension of Duwamish No. 1 shell midden onto the project site would be located under the proposed parking lot and planned upland buffer for the southwest area of the site. No excavation of the midden would take place; instead, materials used to construct the parking lot and the upland areas would be deposited over the midden, providing a protective cap, allowing for future access to the midden, if necessary. Adverse affects may be associated with parking or driving large construction equipment on the site, which would compress and fragment shell midden deposits.

**Alternative 6:** Impacts as in Alternative 5, with project construction in accordance with the precautions identified in the Larson Anthropological and Archeological Services report and the State of Washington determination of No Adverse Effect (see Appendix).

#### **4.8 Potential Impacts on Transportation**

**Alternative 1:** There are no anticipated impacts on transportation.

**Alternatives 2-6:** Marine barges may be used to transport dredged material to/from the site during construction. The completed project will not utilize water, rail or air transportation, though project traffic will cross a single track of the Burlington Northern–Santa Fe Railroad when entering or leaving the parking lot. The train that uses this track typically makes one southbound trip in the morning, and one northbound trip in the afternoon. Train lengths vary from 1 to 20 railcars. Work day traffic during the 12-month construction period is projected to range from approximately 10 to 36 one-way trips per day, generated by 5 to 8 workers (10 to 16 trips per day), and up to 10 trucks (inbound + outbound, 20 trips) per work day.

Based on Terminal 107 public shoreline access site visitation, it is estimated that generally fewer than a dozen people per day would visit the Seaboard Lumber Site Aquatic Habitat Restoration site. Exceptions would be those days when a group of school children may be brought to the site by bus for environmental education. In any event, peak use of the site is expected to occur during off-peak hours (mid-day, evenings and weekends) in relation to adjacent roadway traffic. A significant percentage of visitors are likely to arrive on foot, by bicycle, or some other mode of non-motorized transportation, due to the location of the site along the Duwamish Trail.

Primary access to the proposed parking lot (Alternatives 5 and 6) will be from shared use of the Holland America driveway at the north end of the site. The property on which this driveway is constructed is leased to Holland America by the City of Seattle Department of Parks and Recreation. An outbound driveway may be constructed in the SW Alaska St. street end.

#### **4.9 Potential Impacts on Public Health and Use**

**Alternative 1:** There would be no changes to public use of nearby areas or the waterway, but it is probable that the public would not be allowed onto the Seaboard Lumber site if it is left in its current

state. However, complete prevention of access to the site is probably not feasible. Chronic human contact with the contaminated soils (which could be through exposure to wind-blown dust) could lead to illness.

**Alternative 2:** No housing units or buildings will be eliminated. No views will be altered or obstructed by proposed aquatic habitat restoration improvements. Since most of the site would be excavated for the intertidal basin, there would be no parking or foot paths; public use of the site would be severely limited. There would be no public boat access into the basin from the shore, but kayaks and small boats could access the basin from the river, disturbing plants and wildlife. Tribal and recreational fishing would continue as before, but temporary turbidity from the fill and the duration of the basin stabilization could affect fishing on a short-term basis. Contaminated soils will be removed, benefiting public health.

**Alternative 3:** Same as Alternative 2.

**Alternative 4:** Same as Alternative 2.

**Alternative 5:** An informational kiosk is proposed near the parking lot. This will be the tallest man-made object on the site, at approximately 10.5 feet. Onsite lighting, if any, will be limited to illumination of the informational kiosk. Plantings for upland habitat diversity and visual character are proposed to include coniferous trees, some of which may eventually reach 50 feet in height. Short foot paths will allow limited access onto the site. The City of Seattle Parks and Recreation Department will have to maintain the trash receptacles, parking lot, and foot paths. The site would require periodic Seattle Police patrols for public safety. There would be no public boat access to the basin from the site, but kayaks or small boats could enter the basin from the river, disturbing plant and wildlife. It is estimated that generally fewer than a dozen people per day would visit the site for passive recreational purposes. Due to the small size of the site and limited parking, it will not be widely advertised for visitation for educational purposes. However, organizations such as Seattle Public Utilities do fund bus trips for school children for wetland education, and this site would be desirable for that purpose. It is estimated that 30 to 40 buses per year may bring students to view the site. Fishing impacts are the same as Alternative 2. Contaminated sediments and soils will be capped and removed from environmental exposure, benefiting public health.

**Alternative 6:** Same impacts as Alternative 5.

## **5.0 Selection of the Preferred Alternative**

Based on the criteria listed in section 3.0, Alternative 6: Partial Removal of Areas of Residual Contamination, Moderate Upland Excavation and Intertidal Filling, With Protective Spits, was selected as the preferred alternative.

### **5.1 Alternative 6: Site Development Proposal**

The aquatic habitat restoration proposal includes excavating an intertidal basin, constructing shoreline protection, and introducing aquatic and upland habitat improvements (see Figures 7 through 11). The intertidal marsh to be created on the site will be approximately 1.8 acres in size (77,300 sq. ft), excavated from elevation +11.2 feet Mean Lower Low Water (MLLW) to approximately +6 ft MLLW. The intertidal basin is designed with a curvilinear edge to create a more natural appearance, and to maximize habitat diversity in the edge zone. Substrate composition is an important consideration for the success of the intertidal habitat. Approximately 3,000 cu yd of material will be imported, amended with organics, silts and clays, and distributed over the basin at

depths ranging from 2 to 4 feet. Sources under consideration range from dredged material to be mixed onsite, to manufactured soil of specified content. A transitional scrub/shrub habitat is proposed between the intertidal marsh, upland meadow and forested habitat to be introduced on the site. Proposed demolition will require removing existing concrete pads (former building foundations), pavements, railroad spurs, and an existing dock; extensive regrading; and installing plantings to establish an emergent intertidal marsh.

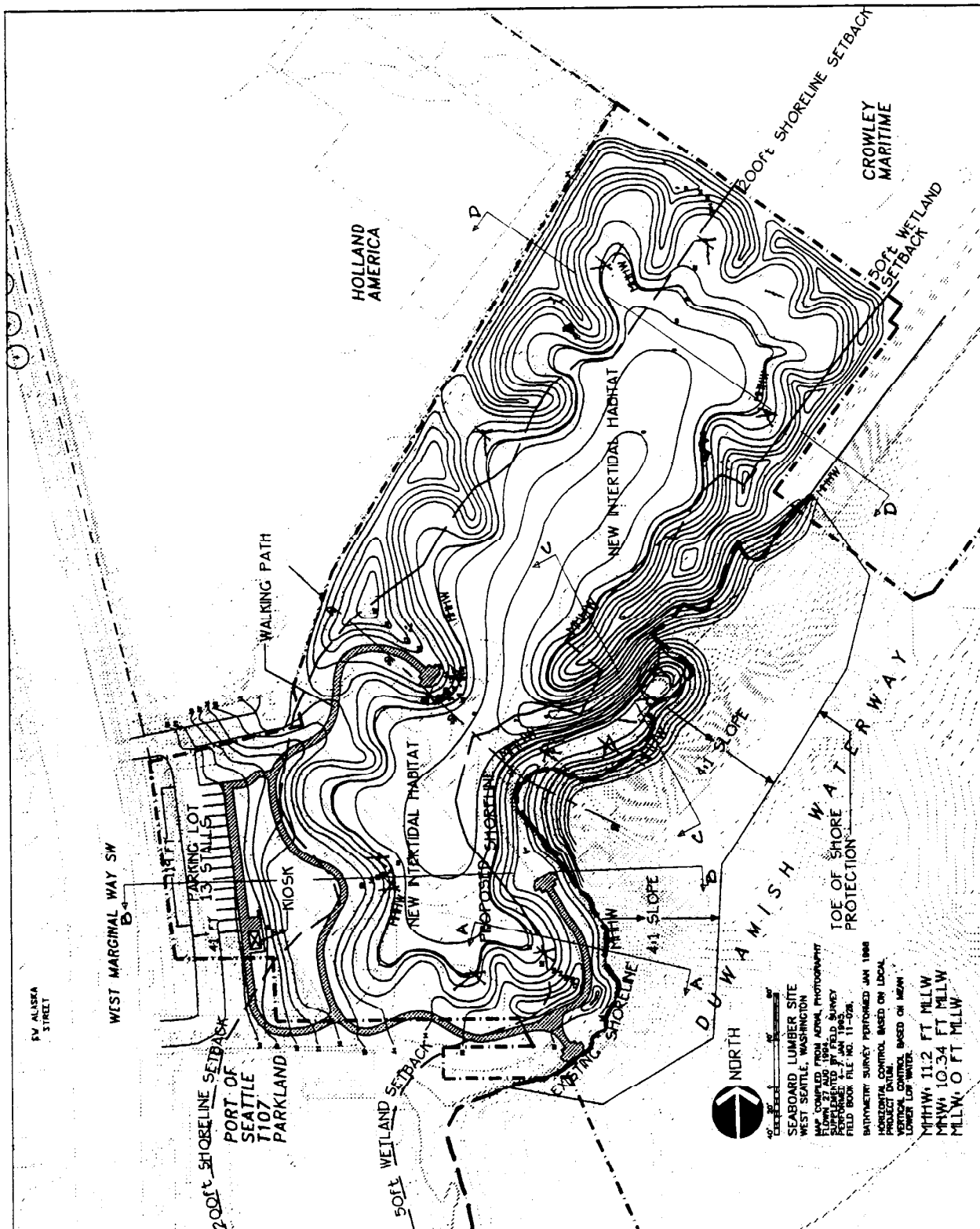
Following is a list of project design criteria (not necessarily in order of priority):

- Maximize aquatic habitat creation.
- Create optimum intertidal habitat elevations.
- Prioritize high marsh restoration, between elevations +8 and +10 ft MLLW.
- Provide upland buffers, 30 ft minimum width.
- Limit the project area to the Seaboard Lumber site and SW Alaska Street end.
- Maintain water depths at the Terminal 105 dock owned by the Port of Seattle (adjacent to the northeast corner of the site).
- Remove as much of the north and south areas of waste-bearing fill as practicable within the available budget, to achieve a balance between site cleanup and habitat restoration.
- Demolish all asphalt; recycle or reuse this material as onsite fill.
- Demolish concrete foundations; recycle or reuse this material as onsite fill.
- Create a central tidal channel. Offset the two spits to increase wave protection.
- Create a steep transition zone between the marsh bench and the tidal channel.
- Armor spits as necessary to protect waste-bearing fills from contaminant migration.
- Create a convoluted shoreline edge planted with scrub/shrub vegetation.
- Create bermed uplands with fast-growing plantings to provide noise and visual screening to the marsh area, and a source of detritus and insects.
- Introduce habitat structures (e.g., secured logs, partially buried snags, nest and roosting boxes) to attract birds and wildlife.
- Initiate emergent marsh plantings with an experimental plot, and monitor success to determine design for later plantings.
- Develop public access and environmental education features compatible with habitat design.

***Upland Construction:*** Upland non-habitat features of the project will include an asphalt-paved parking lot for 13 cars, an informational kiosk, and compacted crushed rock pathways leading to viewpoints delineated by low, attractive railing with wire mesh panels as a deterrent to further access.

One parking space will be designated for handicapped use, and pathways will be handicapped accessible. The main driveway entrance will be at the north end of the site, shared with Grayline Tour buses (Holland America; see Figure 7). A parking lot exit may be provided at the south end of the site. The through-configuration of the parking lot layout is intended to meet the needs of school buses delivering children to the site for educational opportunities, and to facilitate emergency vehicle access to the site. Non-habitat elements of the project will occupy less than 16,000 sq. ft of the upland portion of the site.





PROPOSED:  
INTERTIDAL MARSH CREATION  
WITH VIEWPOINTS  
IN: CITY OF SEATTLE  
AT: SEABOARD LUMBER SITE  
COUNTY OF: KING STATE: WA  
APPL. BY: SEATTLE PARKS +  
RECREATION  
DATE: JANUARY 30, 1998  
FIGURE: 4 OF 12

CITY OF SEATTLE  
DEPARTMENT OF PARKS  
AND RECREATION

3811 BROADWAY AVE., 4th FLOOR (206-703-1111)

FACILITY TITLE  
SEABOARD LUMBER  
AQUATIC HABITAT RESTORATION

FIGURE 7. PROPOSED DESIGN

PURPOSE:  
FISHERIES HABITAT ENHANCEMENT,  
PUBLIC VIEWING + EDUCATION  
DATUM: MLLW=0.0 (N.O.S.)  
ADJ. WATERFRONT PROPERTY OWNERS:  
HOLLAND AMERICA, PORT OF SEATTLE,  
+ CROWLEY MARITIME

PREPARED BY:  
Lee/Brennan Associates  
E C G International Inc.

Upland habitat structures to be introduced on the site will include, but not necessarily be limited to: waterlogged cedar trees or large logs anchored in place in the marsh or transition zone; dead snag logs partially buried vertically in berms adjacent to forested buffers for perches and for cavity-nesting species; nest boxes for songbirds and swallows; and roosting boxes for bats.

***Shoreline Protection:*** The existing shoreline will be maintained to a point of opening between two constructed spits. The intertidal basin will be protected by parallel spits with erosion control protection consisting of a primary armor layer of 8 to 12-inch quarystone, laid on a gravel filter layer. A surface layer of gravel, soil, and vegetation will be placed on top of the crest of the shoreline protection revetment, for additional erosion control. A single V-shaped channel is proposed between the spits, aligned in a downstream orientation to the current. The channel will have side slopes on the order of 4H:1V, with a bottom elevation of +6 ft Mean Lower Low Water (MLLW). There will be essentially no flat bottom to the channel. This cross section will serve to minimize sedimentation and keep the channel open. A single channel oriented downstream will result in more effective flushing action as the basin empties on receding tides.

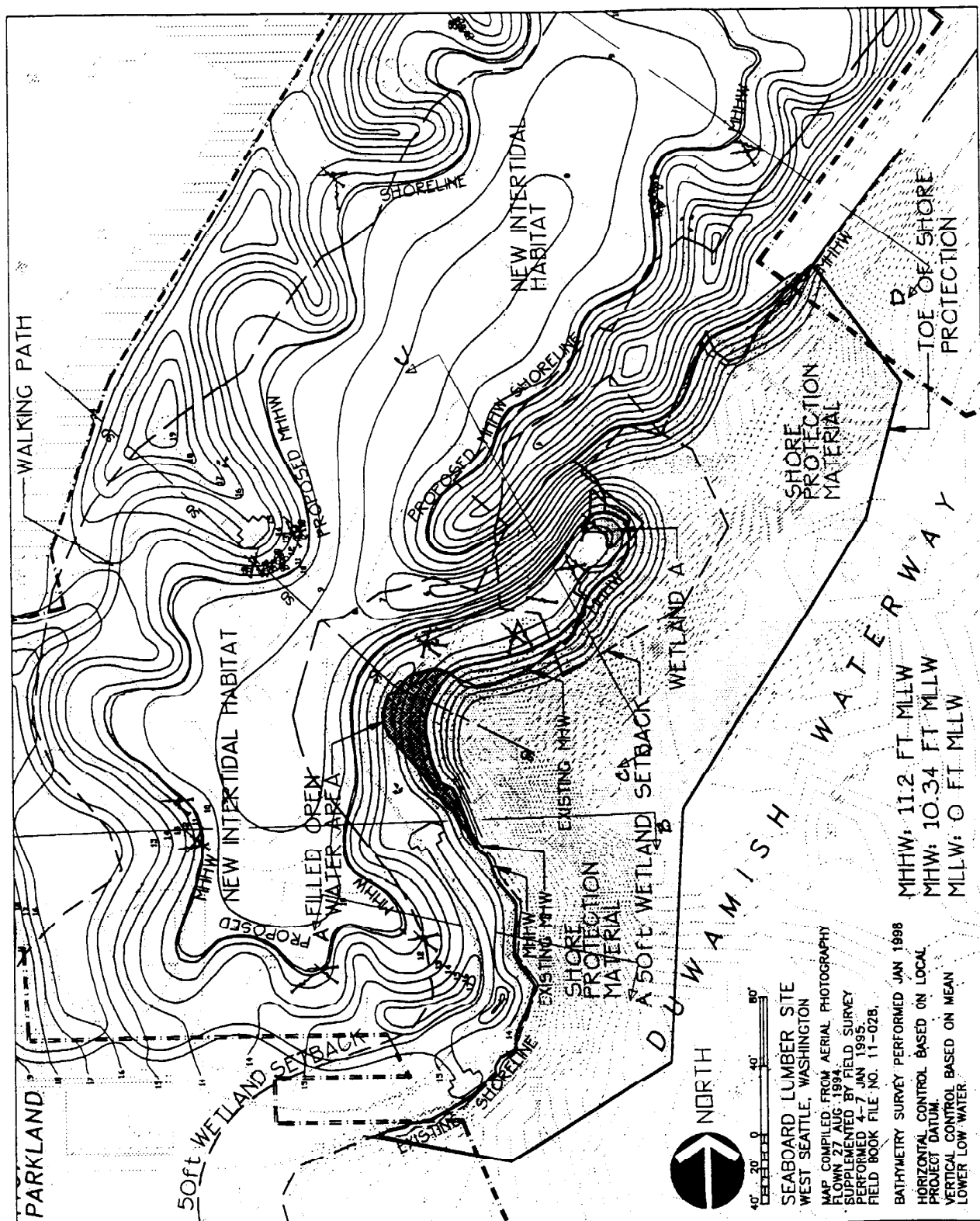
An existing dock structure on the site, its supporting piles, decking and hardware will be removed and disposed at an offsite facility. The structure is approximately 9,200 sq. ft. Approximately 100 to 150 existing creosote-treated wood pilings located in the submerged area of the site may be extracted or cut off as part of the habitat restoration project.

Shoreline armoring will be constructed on the side slopes of the spit from approximate elevation +14 ft MLLW to -15 ft MLLW, to prevent shoreline erosion and exposure of isolated areas of waste-bearing substrate material to the marine environment (see Figure 8). The slope will extend back approximately 5 feet on the crest, to prevent overtopping and undermining by wave action. The slope will be on the order of 4H:1V.

***Offshore Modifications:*** Offshore modifications will be limited to those required to construct shoreline protection. The shoreline armoring proposal will result in placement of fill in the nearshore zone. Toe scour protection is proposed at the slope bottom elevation. The proposal is to place approximately 5,000 tons of quarystone to construct the primary armor layer, and 1,100 tons of gravel material to construct the filter layer. Placement of not more than 7,000 cu yd of fill material on approximately 1.3 acres of intertidal and shallow subtidal areas of the site will be required to provide the substrate slope for armor protection (see Figure 9). This action will have the added benefit of improving nearshore sediment characteristics for fisheries habitat and will create a barrier to erosion by wave action of waste-bearing fills presently located at the shoreline. Offshore grades will remain as they are at present beyond the toe of the slope of the quarystone armor material.

No sediment remediation is proposed for the submerged lands of the site, as offshore sediments were determined to be of generally acceptable quality (Phase II Site Investigation; Herrera Environmental Consultants, May 1996).

***Construction Techniques:*** Construction of the aquatic habitat enhancement project will involve use of both land-based and marine construction/excavation techniques. Upland site preparation and



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INTERTIDAL MARSH CREATION  
WITH VIEWPOINTS  
IN: CITY OF SEATTLE  
AT: SEABOARD LUMBER SITE  
COUNTY OF KING STATE: WA  
APPL. BY: SEATTLE PARKS +  
RECREATION  
DATE: JANUARY 30, 1998  
FIGURE: 5 OF 12

CITY OF SEATTLE  
DEPARTMENT OF PARKS  
AND RECREATION  
311 222ND AVE. 4TH FLOOR (800-7031)

FACILITY TITLE  
SEABOARD LUMBER  
AQUATIC HABITAT RESTORATION

FIGURE 8. PROPOSED SHORELINE MODIFICATIONS

PURPOSE:  
FISHERIES HABITAT ENHANCEMENT.  
PUBLIC VIEWING + EDUCATION  
DATUM: MLLW=0.0 (N.O.S.)  
ADJ. WATERFRONT PROPERTY OWNERS:  
HOLLAND AMERICA PORT OF SEATTLE.  
+ CROWLEY MARITIME

PREPARED BY:  
Lee/Brennan Associates  
E C G International Inc.

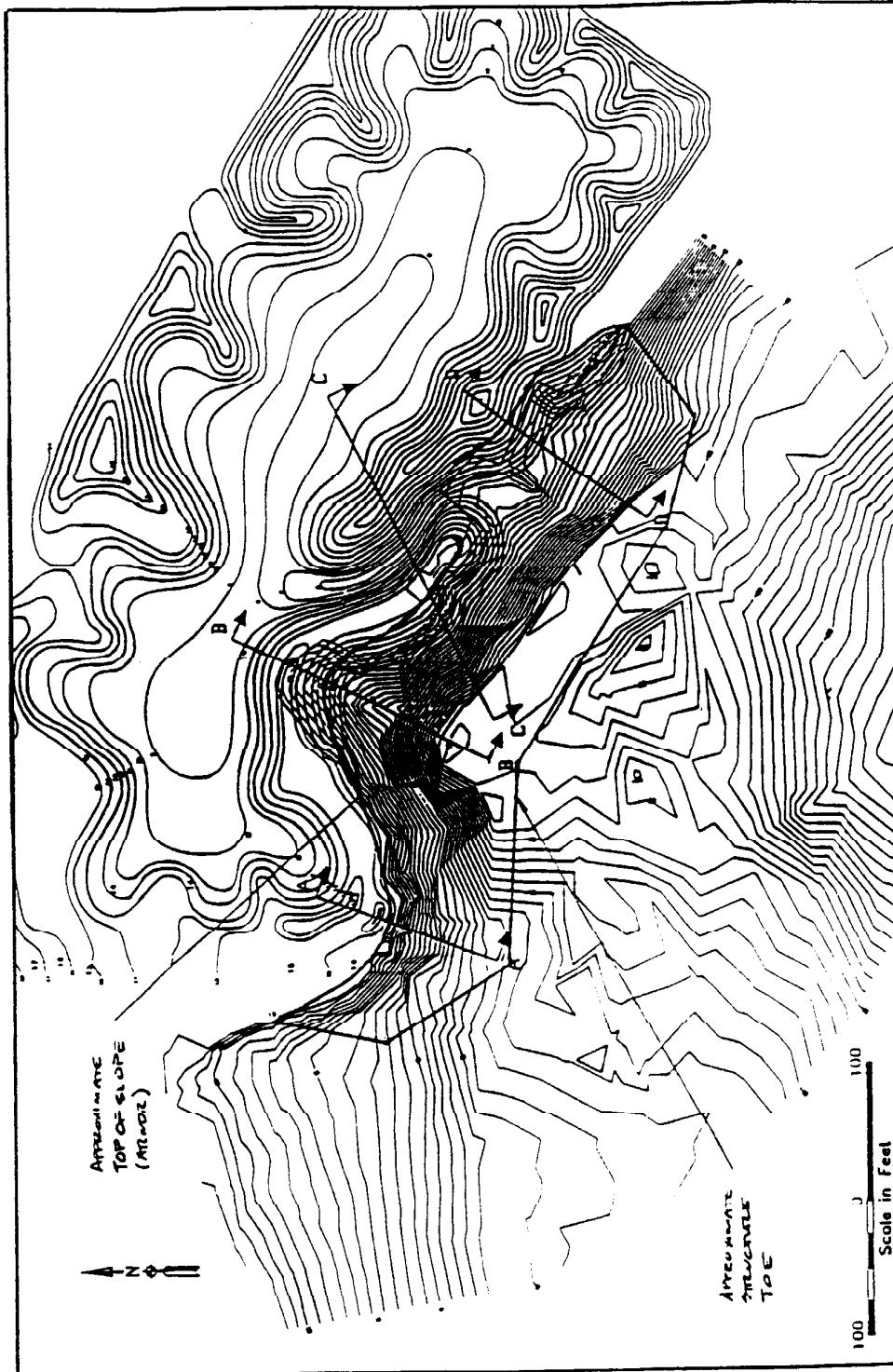


Figure 1  
Plan View  
Seaboard Lumber

Sheetline Arrows  
Smooth Round Quaystone  
1V:4H

PROJECT:  
Seaboard  
FILE:  
Xmas  
DATE: 1/10/98

PROPOSED:  
INTERTIDAL MARSH CREATION  
WITH VIEWPOINTS  
IN CITY OF SEATTLE  
AT SEABOARD LUMBER SITE  
COUNTY OF KING STATE, WA  
APPL. BY: SEATTLE PARKS +  
RECREATION  
DATE: JANUARY 30, 1998

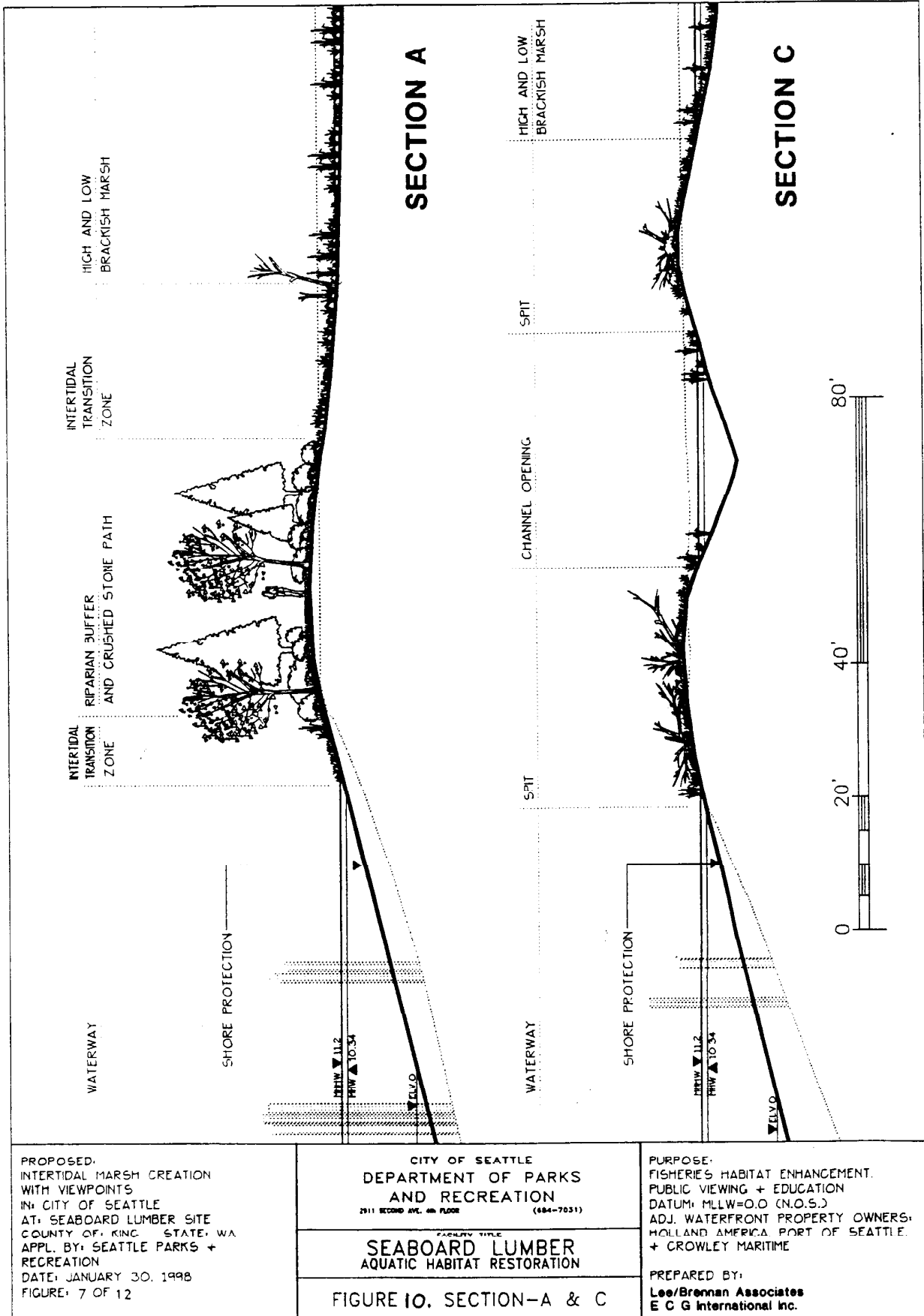
CITY OF SEATTLE  
DEPARTMENT OF PARKS  
AND RECREATION  
2011 20000 001 00 0000 (0000-7001)

FACILITY TITLE  
SEABOARD LUMBER  
AQUATIC HABITAT RESTORATION

FIGURE 9.

PURPOSE:  
FISHERIES HABITAT ENHANCEMENT,  
PUBLIC VIEWING + EDUCATION  
DATUM: MLLW-0.0 (N.O.S.)  
ADJ. WATERFRONT PROPERTY OWNERS:  
HOLLAND AMERICA PORT OF SEATTLE,  
+ CROWLEY MARITIME

PREPARED BY:  
Lee/Brown Associates  
E C G International Inc.





intertidal basin construction could involve excavation using land-based backhoes, trackhoes, front-end loaders, D-6 or larger bulldozers, smaller loaders and excavators, and dump trucks. Portions of the intertidal basin excavation/construction may also be accomplished using clamshell dredge, hydraulic dredge, hydraulic marine excavator, dragline or skid- or barge-mounted material pumps. Channel excavation, shoreline armoring construction, and marine structure demolition are likely to be accomplished using a clamshell dredge, hydraulic dredge, skid- or barge-mounted pumps, material barges, dredge tenders and tugs.

The proposal may include the mechanical breaking of asphalt and concrete foundation material to make it permeable, or crushing these materials for use as fill beneath the proposed parking area and upland berms. Excess demolition material will be hauled offsite for recycling or disposal.

## **6.0 Potential Environmental Consequences of the Preferred Alternative:**

- Approximately 16,510 sq. ft of new impervious surfaces would be placed on the site.
- Approximately 7,000 cu yd of fill would be placed in the nearshore area of the site, containing and capping any contaminated sediments located there.
- Temporary conditions of turbidity would occur during placement of fill for shoreline protection, dock removal, and breaching the channel between spits to allow inundation of the excavated intertidal basin
- Temporary conditions of mud and dust would occur along W Marginal Way SW and on the Duwamish Trail in the site vicinity.
- Temporary construction vehicle and marine vessel exhaust emissions to the air would occur during earthwork activities on the site.
- It is likely that groundwater will be encountered during construction, possibly requiring dewatering.
- There is a small risk of accidental spill and exposure to petroleum-derived fuels and lubricants associated with the operation of earth moving equipment and motor vehicles on the site.
- Short-term noise level increases will occur on the site and in the surrounding area during construction.
- Project traffic will increase use of the Holland America access road, vehicular crossings of the Burlington Northern-Santa Fe Railroad track, and vehicular crossings of the Duwamish Trail. It is estimated that approximately 6 to 10 vehicles per day may visit the completed aquatic habitat restoration project. It is estimated that 10 to 36 one-way vehicular trips per day may occur during the construction period.

## **6.1 Potential Cumulative Impacts of the Preferred Alternative**

The preferred project alternative will remove some contaminated soils, stabilize and isolate the rest, and add important and essential habitat to two other natural areas in the last remaining oxbow of the Duwamish River: the adjacent T-107 site and nearby Kellogg Island. This major restoration project will provide a significant increase in upper intertidal marsh habitat for salmonid use and add a riparian buffer for wildlife use. Creating an unbroken stretch of natural habitat in this former industrial area of the river provides a larger resting and foraging area for migrating salmonids and other wildlife. The public benefits by having an added area for viewing

nature and learning about riparian restoration projects. Other than a potential for a slight increase in traffic (school buses) during certain periods of the week, no negative cumulative impacts are expected.

## **6.2 Mitigation Proposed for Potential Impacts of the Preferred Alternative**

- The proposal includes participation in the Washington State Department of Ecology's Voluntary Cleanup Program (VCP) to partially remove and bury in place, soils with residual concentrations of chemicals.
- The contractor will be required to comply with all applicable state and local regulations for erosion and sedimentation control (ESC).
- A construction entrance shall be stabilized at the beginning of construction and maintained for the duration of site work to minimize dirt, mud, and soils with possible residual levels of chemicals being tracked onto W Marginal Way SW.
- A wedge of unexcavated land will be maintained in the shoreline protection structure during excavation of the intertidal basin, to be breached during low water and allowed to settle for several weeks prior to completion of habitat features.
- A silt curtain may be placed around marine construction activity to minimize resuspension, if resuspension of fines is a concern.
- Shoreline erosion protection will be constructed along the channelward face of the shoreline and spits, and will be extended along both sides of the intertidal basin channel into the basin area.
- The construction contractor will implement an appropriate groundwater dewatering program, if required, which may involve temporarily discharging silt-laden groundwater to "Baker" tank trucks, or obtaining a permit for temporary discharge to the sanitary sewer.
- Soil to be imported to enhance the success of plantings will act as a protective layer to subaqueous soils with residual chemical concentrations.
- It will be a condition of the construction contract that the contractor shall not discharge to the ground any cleaning solvents or chemicals utilized on tools or equipment.
- Equipment refueling shall be conducted away from the Waterway. Any fuel stored onsite shall be kept in a contained area to intercept spills.
- A contingency plan for potential spillage of fuel or contaminated material shall be developed prior to initiating earth work on the site.
- No herbicides or pesticides are proposed for use on site plantings.
- Fertilizers which may be used to amend imported soils for proposed plantings will be organic, slow-release fertilizers.
- Landscaping is proposed with diverse native plant community types to enhance the poor existing aesthetic condition of the site, increase habitat diversity, and attract wildlife.
- Public access will be limited to the south and west sides of the project, which will protect significant new habitat areas from human disturbance.
- Project implementation will develop physical attributes and food web requirements important to juvenile salmonids and other nearshore fishes.
- No in-water work will be performed during the state's Hydraulic Project Approval (HPA) closure period for salmon migration: March 14 to June 14.



**Mitigation Proposed for Potential Impacts (continued):**

- Contractors will be required to operate equipment in compliance with the City of Seattle Energy Code and Noise Ordinance, at a minimum.
- Contractors shall comply with WISHA standards for worker safety, at a minimum.
- Fill and compaction over the area of known midden resources shall be coordinated with a qualified archaeologist to assure no potential adverse impact to the midden.
- A qualified archaeologist shall be retained to monitor earthwork in the event any excavation is proposed within an area of possible cultural resources.
- Raised berms shall be created where trees and shrubs are to be planted within the area of known midden resources, if the depth to the midden requires this protection (see References: Larson Anthropological Archaeological Services)

**Soil and Sediments**

The small, 13-car parking lot, entrance drive, and crushed rock trails are the only impervious surfaces to be introduced on the site. The total square footage of new asphalt pavement will be approximately 8,440 sq. ft. Trails to be constructed of 3/8-inch or 5/8-inch crushed rock compacted to 95 percent density for handicapped accessibility will result in essentially impervious surfaces over an additional 8,070 sq. ft of the site. These improvements are estimated to comprise approximately 16,510 sq. ft total, or about 6.6 percent of the upland site area. Currently, the site has approximately 44,200 sq. ft of concrete and 136,000 sq. ft of asphalt. There will be a net reduction of 163,490 sq. ft of impervious surfaces upon completion of the project.

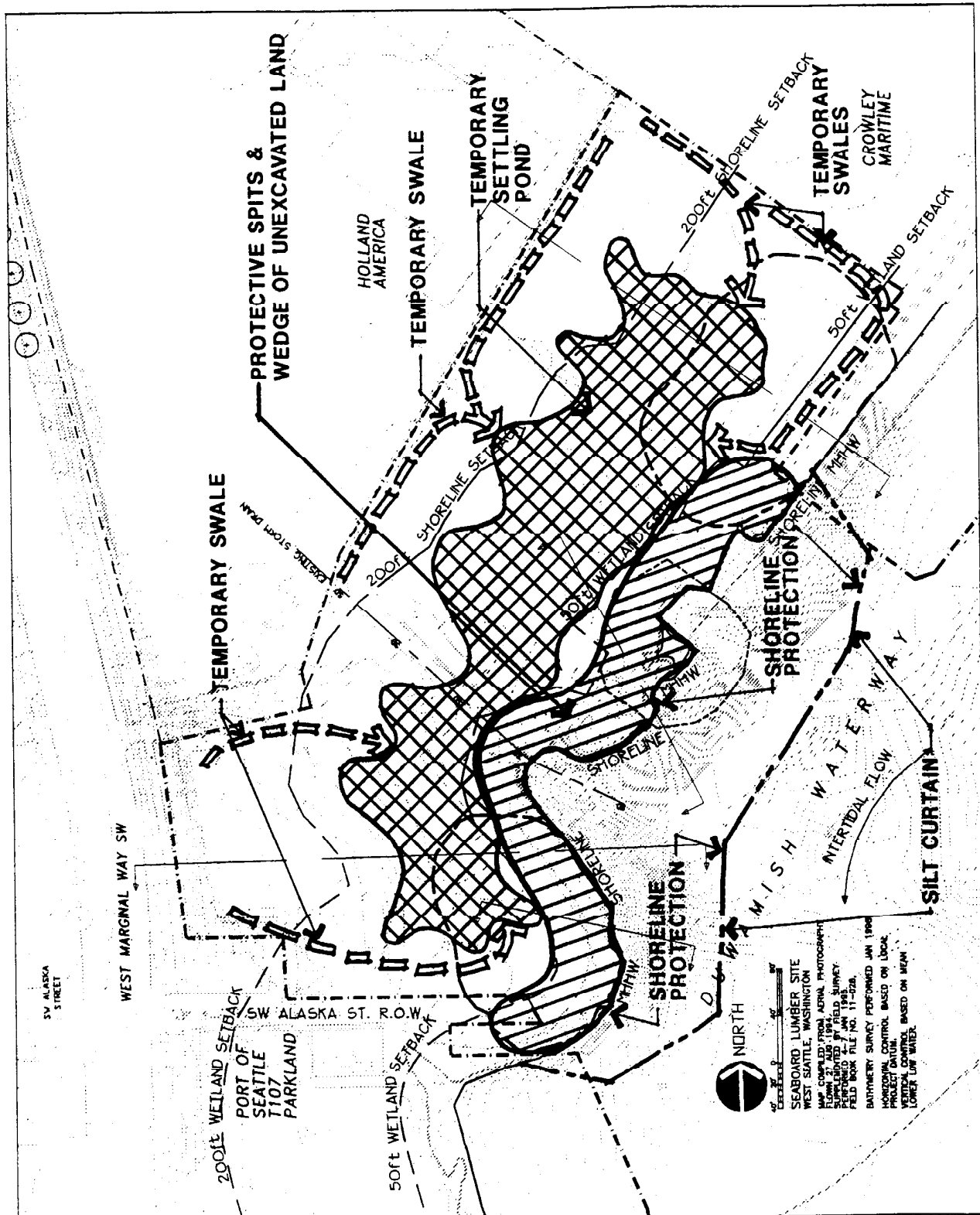
The contractor will be required to comply with all applicable state and local regulations for erosion and sedimentation control (ESC). Sediment laden runoff water shall be prevented from entering the site drainage system or the Duwamish Waterway. During the majority of the construction period, the newly created intertidal basin will function as a settling pond (see Figure 12).

The contractor shall use proper temporary ESC practices, whether or not shown on the drawings, to prevent upland sediments and other debris from entering the Waterway. These may include, but shall not necessarily be limited to, constructing temporary swales which direct onsite runoff into the temporary sedimentation basin; placing sand bags to separate work areas from flowing water; placing mulch on exposed areas; installing erosion control fabric; placing straw on bare soils; covering stockpiles with plastic; and any other measures that may be warranted by site and weather conditions, or as requested by the Owner.

The contractor shall place a 2-inch thick layer of straw mulch and/or hydromulch over all exposed upland soils subject to erosion during periods of wet weather, or as directed by the Owner.

The construction entrance shall be stabilized at the beginning of construction and maintained for the duration of site work to minimize dirt and mud being tracked onto W Marginal Way SW.

Temporary side slope excavations during construction shall be no steeper than 1 horizontal to 1.5 vertical (1H:1.5V) in granular materials, and no steeper than 1H:1V in cohesive materials.



PROPOSED:  
INTERTIDAL MARSH CREATION  
WITH VIEWPOINTS  
IN: CITY OF SEATTLE  
AT: SEABOARD LUMBER SITE  
COUNTY OF KING STATE: WA  
APPL. BY: SEATTLE PARKS +  
RECREATION  
DATE: JANUARY 30, 1998  
FIGURE: 6 OF 12

CITY OF SEATTLE  
DEPARTMENT OF PARKS  
AND RECREATION  
3111 SECOND AVE. 3RD FLOOR (206-465-7081)

FACILITY TITLE  
**SEABOARD LUMBER**  
AQUATIC HABITAT RESTORATION

FIGURE 12. EROSION/SEDIMENTATION  
CONTROL PLAN

PURPOSE:  
FISHERIES HABITAT ENHANCEMENT,  
PUBLIC VIEWING + EDUCATION  
DATUM: MLLW+0.0 (N.O.S.)  
ADJ. WATERFRONT PROPERTY OWNERS:  
HOLLAND AMERICA, PORT OF SEATTLE,  
+ CROWLEY MARITIME

PREPARED BY:  
Lee/Bremner Associates  
E C G International Inc.

Earth moving equipment will be parked in a prescribed area when not in use, in order to control or contain potential petroleum fuel leaks. Any fuel stored onsite shall be kept in a leak-proof area (e.g., behind a designated berm or other suitable containment area) to intercept spills.

It will be a condition of the construction contract that the contractor shall not discharge to the ground any cleaning solvents or chemicals utilized on tools or equipment. Refueling equipment shall be conducted away from the Waterway, and done in a manner to prevent spills from potentially entering groundwater or the Waterway.

A contingency plan for potential spillage of fuel or contaminated material will be developed prior to initiating earth work on the site. Measures will be implemented to control upland releases and aquatic area spills. Any spill to the aquatic environment would be reported to the U.S. Coast Guard, and the Coast Guard would supervise cleanup actions, in accordance with Coast Guard regulations. The City of Seattle Department of Parks and Recreation would be responsible for documenting any environmental impacts resulting from an accidental spill.

It will be a condition of the construction contract that the contractor comply with WISHA standards for worker safety, at a minimum. Additional requirements may be specified on a per-job basis. During construction, it is the responsibility of contractors to provide for the safety of their workers, including proper training and personal protective gear, if necessary. The Department of Labor & Industries is the enforcement agency for WISHA compliance.

It is anticipated that work above elevation +5 ft MLLW will be affected by tidal influences because of coarse-grained sandy fill materials. Work below elevation +5 ft is anticipated to be in saturated fine-grained silty materials. The intertidal basin excavation will begin at the landward edges. A wedge of unexcavated land will be maintained in the channel between spits, until the basin is ready for inundation. The shoreline will be breached during low water, and allowed to settle for several weeks prior to the completion of habitat features.

Shoreline protection construction (shoreline armoring) and other marine construction will be performed in a manner that will minimize erosion of existing soils. A silt curtain may be placed around marine construction activity to minimize resuspension, if resuspension of fines is a concern. If used, the silt curtain would extend from the water surface to the marine floor, isolating any suspended sediments from the adjacent marine environment. Shoreline erosion protection will be constructed along the channelward face of the shoreline/spits. Shoreline protection measures will be extended along both sides of the intertidal basin channel into the basin area.

### **Air Quality**

The minimal level of expected air quality impacts attributable to the project will not require air quality mitigation measures. The contractor will be required to implement standard construction practices for dust suppression and avoiding deposition of mud and dust on W Marginal Way SW (e.g., minimizing construction vehicle track-out). It is anticipated that a water truck will be onsite throughout the upland demolition/construction activity for dust suppression, as necessary.

There will be no groundwater withdrawal or discharge to groundwater associated with the aquatic habitat restoration proposal. It is likely that groundwater will be encountered during demolition (removal of foundations), and during excavation of the intertidal basin. If this occurs, the construction contractor will implement an appropriate dewatering plan, which could involve temporarily pumping silt-laden groundwater seepage to a "Baker" tank truck, or obtaining a permit for temporary discharge to the Metro sewer.

### **Water Quality**

Stormwater runoff from the site may occur during construction, and will occur from the completed development. Stormwater runoff during construction (if any) will be controlled through the implementation of Best Management Practices (BMPs) described above: downslope placement of filter fencing, mulching, and/or covering exposed areas with plastic sheeting (if weather conditions warrant).

No subsurface collection systems are proposed for post-development stormwater management. Stormwater runoff will be collected in grass-lined swales (bio-swales) on each side of the paved parking lot. Additional grass-lined swales may be constructed along the northwest and northern perimeter of the project area to direct runoff into the intertidal basin and away from adjacent properties. During periods of heavy precipitation, stormwater runoff from upland areas of the developed site will flow overland to the excavated intertidal basin, ultimately mixing with the waters of the Duwamish Waterway upon tidal flushing of the basin. The Duwamish Waterway flows into Elliott Bay approximately 2 miles north of the site.

There will be no intentional occurrence of waste materials reaching ground or surface waters. There is a small risk of accidental spill and exposure to petroleum-derived fuels and lubricants associated with the operation of earth moving equipment and motor vehicles on the site.

Augmented/manufactured soil or clean dredged material will be imported for use as substrate in the intertidal basin. The depth of material will range from 2 to 4 feet, which will act as a protective layer to subaqueous soils with residual chemical concentrations (below regulatory standards).

No adverse water quality impacts are anticipated. It will be a condition of the construction contract that the contractor shall not discharge to the ground any cleaning solvents or chemicals utilized on tools or equipment. Equipment refueling shall be conducted away from the Waterway, and done in a manner to prevent spills from potentially entering groundwater or the Waterway. Any fuel stored onsite shall be kept in a contained area. No herbicides or pesticides are proposed for use on site plantings. Fertilizers which may be used to amend imported soils for proposed plantings, will be organic, slow-release products.

### **Landscaping**

Landscaping is proposed with plant community types native to the Puget Trough. The intertidal marsh will be vegetated through a combination of planting and allowing natural recruitment. Marsh vegetation will be protected from goose grazing by the installation of wooden stakes driven into the soil around newly planted material with twine tied criss-crossing over the plantings from one stake to another.

Upland habitat landscaping is proposed to significantly enhance and diversify the plant community on the site, and attract wildlife. Terrestrial habitat types to be created include upland meadow, dune, shrub buffer and forest edge. Wildlife habitat features to be created for the benefit of birds and small mammals will include nest boxes for songbirds and swallows; roost boxes for bats; snags, stumps, brush piles and downed logs.

The proposal includes limiting public access to the south and west sides of the project, which will protect significant new habitat areas from human disturbance.

The proposed project has been designed to create an environment which will develop both physical habitat and food web attributes important to juvenile salmonids and other nearshore fishes. The physical design will create an intertidal basin at elevations appropriate for emergent marsh development. The embayment is also designed to create quiescent conditions to promote settling and accumulation of fine sediments and organic matter. Each of these physical properties will contribute to the development of a shallow nearshore environment preferred by juvenile salmonids and other fishes, and prey organisms utilized by these fish.

#### **7.0 List of Agencies Consulted**

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service; National Ocean Service  
U.S. Department of the Interior, Fish and Wildlife Service  
U.S. Army Corps of Engineers  
The Suquamish Tribe  
Muckleshoot Indian Tribe  
Washington State Department of Ecology  
Washington State Department of Natural Resources  
Washington State Department of Fish and Wildlife  
King County Surface Water Management Division  
City of Seattle Parks and Recreation Department  
Port of Seattle

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